

International Civil Aviation Organization

First Meeting of the Asia/Pacific Regional Search and Rescue Working Group (APSAR/WG/1)

Bangkok, Thailand, 15 - 19 August 2016

Agenda Item 3: Global Update

ANNEX 12 CONSIDERATIONS

(Presented by the United States)

SUMMARY

This paper provides discussion on possible future amendment of Annex 12 or recommendations for inclusion of SAR concerns in other annexes when they come under review. ICAO Montreal is currently revising certain annexes to the Chicago Convention which affect Annex 12 – Search and Rescue. SAR services now have the opportunity to consider possible revisions to Annex 12 or aspects of other annexes which affect SAR.

1. INTRODUCTION

1.1 ICAO Montreal is currently revising certain annexes to the Chicago Convention which affect Annex 12 – Search and Rescue. SAR services now have the opportunity to consider possible revisions to Annex 12 or aspects of other annexes which affect SAR.

2. DISCUSSION

2.1 Based on lessons learned from recent aviation incidents ICAO Montreal began work on improving global flight tracking. The near-term effort under normal tracking has focused on amendments to Annex 6 *Operation of Aircraft, Part 1 International Commercial Air Transport - Aeroplanes.* Work is now progressing on the mid- and long-term effort under the Global Aeronautical Distress and Safety System (GADSS) Concept of Operations. Work under GADSS will likely include changes to other ICAO annexes, including Annex 12 – *Search and Rescue.*

2.2 As work progresses on the other Annexes, SAR services need to stay current to see if wording within Annex 12 should also be adjusted. Annex 12 is affected by other annexes but users of Annex 12 may also have been waiting for the moment those annexes are open for amendment.

2.3 The ICAO Chicago Convention has 19 annexes, including Annex 12 – Search and Rescue. However, several other annexes (such as Annex 6, 9, 10, 11, and 13) have content important to SAR. Discussions in various ICAO forums have indicated concerns, including:

- 2.3.1 Annex 6 *Operation of Aircraft*: The operator of the aircraft (owner or company) having a larger role in flight tracking and distress tracking.
- 2.3.2 Annex 9 *Facilitation*: The ICAO Regional and Inter-regional Seminar and Workshop for SAR in July 2016 revealed a concern with this annex as regards to Chapter 8 B *Facilitation of search, rescue, accident investigation and salvage*. Issue could be that of rapid entry for SAR or the immigration authority quickly taking charge of survivors. The idea was for Annex 12 to have a further recommendation on this matter.

- 2.3.3 Annex 11 *Air Traffic Services*: The operator of the aircraft (owner or company) and Air Traffic Services having a larger responsibility with one minute distress reports under the GADSS concept. Chapter 5 *Alerting Service* may need revision and also reflected within Annex 12
- 2.3.4 Annex 13 Aircraft Accident and Incident Investigation: Lessons learned from aircraft incidents indicated accident investigators rapidly got to the scene of the incident but their priorities sometimes conflicted with SAR priorities on search areas and search resources.
- 2.3.5 Are there other areas of concern to consider for SAR?

Note: a list of issues for Annex 12 noted by the ICAO Asia and Pacific Office is appended at Attachment A.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
 - a) note the information contained in this paper; and

b) decide what may be a reasonable way forward in the future for possible amendments to Annex 12 or having the other Annexes better consider the SAR needs within Annex 12

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ICAO Asia and Pacific Regional Office: Annex 12 Issues

Issue 1: SAR Phases

1.1 The Twenty Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/25, Kuala Lumpur, Malaysia, 8 to 11 September 2014) discussed the apparent problems with traditional SAR phases in respect of lessons learnt from MH370:

3.2.69 India recalled the Annex 11 and 12 SAR alerting phases, stressing that the primary objective of the SAR actions was to organize and extend timely assistance to the aircraft in a state of emergency and averting a situation that might lead to human lives being endangered. India noted that duration of 30 minutes in the 'Uncertainty phase' was primarily to try to establish communication with the aircraft by various means and ascertain its position and status. This loss of valuable time was all the more critical in airspace with ATS surveillance, where it was more evident that there was a problem. India suggested that it may be appropriate to combine both uncertainty and alert phase with objective-oriented measures and a sequence of actions aimed at expeditiously ascertaining the situation and swiftly initiating SAR missions.

3.2.70 IATA advised that they supported a reduction in the SAR response timeframe as suggested by India, but also noted that they would be concerned if a mandate for SATCOM was being considered. The meeting congratulated India for the excellent paper, noting its valuable suggestions and correlation with other submissions in regard to the SAR phases.

1.2 The Third Meeting of the Asia/Pacific Regional Search and Rescue Task Force (APSAR/TF/3, 25 to 29 January 2015, at Hulhulé Island, Maldives) analyzed SAR lessons learnt from the MH370 and QZ8501 events, in order to recommend changes to policies and procedures, including global standards. The following is an excerpt from the APSAR/TF/3 Report:

4.2 The meeting noted the following issues as being possible lessons learnt that could be incorporated into the Asia/Pacific Plan:

- a) The time lapses of more than 16 minutes between the transfer of control point at IGARI and the advisory to Kuala Lumpur ACC that MH370 had disappeared, 38 minutes for the declaration of an INCERFA SAR phase and 7 hours and 21 minutes for the declaration of an ALERFA/DETRESFA SAR phase by Viet Nam indicates that there was a need to divert more resources and/or urgency in the ATC response;
- b) It is apparent that a higher degree of civil/military coordination may have revealed the MH370 course reversal much earlier, and as the track also crossed Thailand's PSR coverage, advice to Thailand may have also proved beneficial. Considerable time had been lost in the initial search, partly due to poor civil/military cooperation;
- c) Annex 11 and Annex 12 SAR phases and actions needed to be revised (Annex 11, Section 5.2, and Annex 12, Section 5.2 refer) to take into account the expectations and capabilities of an ATS surveillance environment, the need for civil/military coordination where appropriate, and advisories to all neighbouring ACCs in the case of uncertainty of the aircraft's track; and

d) Poor SAR preparedness and ad hoc SAR coordination between States, including the intervention by political decision-makers needs to be addressed if an optimal operational response was that it was difficult to reconcile the primary radar trace with an airliner's capability, adding further doubt at the time.

1.3 In conclusion, and noting the some States such as Australia have already amended their standards to 15 minutes for the onset of an uncertainty phase, it would appear to be appropriate for the timing of SAR phases to be amended to reflect the difference between procedural and surveillance operating environments. The JWG needs to consider whether Annex 11 paragraph 5.2.1 a) (with respect to a 30 minute lapse before issuing an uncertainty phase) and 5.2.1. b) (with respect to a five minute lapse on approach before issuing an alert phase) needed an additional clause to introduce a 10 minute and a three minute standard respectively for ATS surveillance airspace.

Issue 2: Division of Responsibility between Annex 12 and Annex 13

1.4 The problems that manifested from an unclear division of responsibility between Annex 12 (SAR) and Annex 13 (Accident Investigation) were very clear during both the MH370 and the QZ8501 events. In the case of MH370, the Malaysian government had mistakenly believed that they were responsible for the search after the early handover from Viet Nam, because Annex 13 established the State of Registry as being in charge of the accident investigation. This led to assets being operated without reference to either the Kuala Lumpur Rescue Coordination Centre (RCC) or the Australian RCC within the Australian SRR. After ICAO intervention, an Annex 12 response administered by the Australian RCC was agreed between the governments of Malaysia and Australia, but this confusion caused a delay of several days before a proper SAR search was undertaken in these waters.

1.5 While it is acknowledged that certain aspects of accident investigation can and should commence as soon as possible after an aircraft goes missing (such as retention of surveillance recordings), it is also obvious that the search and recovery function under Annex 13 cannot supersede the search and rescue of humans until such time as it is considered that there is no realistic prospect of survivors. The following are relevant excerpts from the APSAR/TF/3 Report:

4.5 The following recommendations were made by Malaysia for consideration by the APSAR/TF in terms of SAR system improvements:

- a) extend the transmission life of Underwater Locator Beacons (ULBs) installed in flight recorders on all commercial aircraft;
- b) closer civil/military airspace coordination and communication;
- c) clearly defined division of responsibilities between the SAR functions (Annex 12) and the air accident investigation search and recovery functions (Annex 13); and
- *d) establishment of a legal framework to support the roles and responsibilities in handling various SAR missions.*

4.16 Australia noted that numerous challenges affected the MH370 search operation, including:

- *a) lack of available and accurate position data about MH370's actual flight path;*
- b) no distress beacon detections from ELT;

- *c) remote oceanic operations, limiting the choice of suitable search aircraft assets to those which could operate with sufficient endurance and range;*
- *d)* a period of 10 days before the search commenced within the Australian SRR, and the resultant oceanic drift that led to large search areas and wide debris dispersal;
- *e) two tropical cyclones that influenced oceanic drift modelling;*
- f) poor weather and search conditions on a number of days;
- g) long transit times for ships to reach aircraft sightings;
- *h)* availability of ship-borne helicopters to investigate sightings (the Ocean Shield helicopter became unserviceable in transit);
- *i) time required for satellite imagery analysis before tasking SRUs;*
- *j) multinational civil/military cooperation, coordination and communications;*
- *k) media pressure, requiring a JRCC Australia Media Team and social media updates;*
- *l)* volume of information submitted online and via email which required processing (including Internet submission of crowd-sourced satellite imagery);
- *m)* volume of sea pollution making it difficult to distinguish possible MH370 debris;
- *n) lack of a detailed description of cargo carried (colour, type, etc.) to enable correlation against any floating objects sighted;*
- *o)* lack of information regarding aircraft components which were likely to float (this information was eventually provided by the aircraft manufacturer – composite material components were indicated as the most likely to float);
- *p)* sustainment of large logistical requirements such as air search observers, fuel, search unit maintenance and resupply requirements, accommodation, etc.; and
- *q)* lack of a clearly defined division of responsibilities between the search and rescue function (Annex 12) and the air accident investigation search and recovery function (Annex 13).

1.6 During the recent AFI/MID/APAC Inter-regional SAR Workshop (19-22 July 2016, Mahe, Seychelles) in regard to analysis of the QZ8501 accident, the following policies were discussed:

SAR and Accident Investigation – *The Accident Investigation should not complicate SAR efforts:*

a. requesting that SRU keep out of the most probable area to conduct underwater detection for the black boxes; or asking SAR units to remain stationary while they do their search for the black box; or deploying a buoy to recover black boxes and hinder the SAR operation unless this is under the command and control of the RCC; b. investigators should be educated to understand that SAR is separate from investigation so should make provisions to utilize their own resources instead of using SAR assets as this may cause delay to the launch for SAR ops.

The search for the black boxes should not be conducted under the Command and Control of AIG until such time as the possibility of survivors is so low that the official SAR response is terminated.

There must be a handover of command and control between the Annex 12 and Annex 13 elements and only one can be in charge at a time.

This relationship is NOT clear in ICAO documents at present, and was also identified as a problem in the MH370 event.

1.7 At present (apart from Section 4.5 regarding wreckage – where the salvage of wreckage is clearly not an RCC responsibility or function), the only references to the relationship between SAR and AIG activities in Annex 12 are as follows:

3.2.3 Contracting States shall ensure that their search and rescue services cooperate with those responsible for investigating accidents and with those responsible for the care of those who suffered from the accident.

3.2.4 **Recommendation.**— To facilitate accident investigation, rescue units should, when practicable, be accompanied by persons qualified in the conduct of aircraft accident investigations.

1.8 However, this is not clear as it does not specify which agency is in charge of an on-going search (i.e.: who has command and control). This is particularly important when aerial assets may even be in conflict when under the control of different agencies. Therefore, a clear statement in both Annex 12 and 13 that clarifies that the search must be under the command of the appropriate SAR function until such time as there is no possibility of survivors is necessary; but this does not preclude AIG activity when approved by the RCC.

Issue 3: Provision of Information to Support SAR Responses

1.9 One of the key problem areas evident during the early search for MH370 was the lack of accurate information, including crucial data such as ATS surveillance information, the cargo manifest and which items were likely to float. The following is an excerpt from the APSAR/TF/3 Report:

4.19 The APSAR/TF had an extensive discussion about the lessons that might be learnt from the MH370 event. Considering APANPIRG Conclusion APANPIRG/25-22: Provision of MH370 Feedback, the Task Force expressed its disappointment at the unfortunate lack of participation by Viet Nam at APSAR/TF/3. In addition to those already provided in WP05, the lessons included the following points regarding the need for:

a) adequate testing of systems (regular testing, or during SAR Exercise - SAREX) to ensure an efficient Annex 11/12 response;

- b) States (or sub-regional/regional bodies) to minimise the 'grey areas' over unclear aeronautical-aeronautical and aeronautical - maritime SRR boundary responsibilities, especially in the latter case regarding an aircraft ditching into the sea;
- c) improvements in the cooperation between international bodies such as Iridium, Cospas-Sarsat and Inmarsat to enhance technical data availability and analysis;
- d) improvements in cooperation between States and State entities through ICAO Standards and State legislation (note: Annex 12 paragraph 5.1.1. merely refers to 'SAR organisations' being compelled to provide information to RCCs, whereas the scope of cooperation should be much wider);
- *e) air traffic controllers to have relief or a supervisor for emergency response support;*
- f) familiarisation of ATC unit and airline operating systems through regular visits/liaison by RCC personnel to relevant ATC units and Airline Operating Centres (AOCs);
- g) RCC staff to be full-time specialised officers expert in the field of SAR;
- *h)* appropriate training of military responders regarding civilian SAR systems and standards and recommended practices.
- *i)* English language proficiency in all RCCs to ensure correct understanding of communications;
- *j)* regular reports and access to information for key stakeholders (SITREPS and media such as the Internet);
- k) providing authority and empowerment to SAR agencies and therefore SAR Mission Coordinators to effectively coordinate SAR responses through State legislative Acts;
- *l)* management of undue external influences (such as political entities) on efficient RCC responses; and
- *m)* a means of handling media/next-of-kin enquiries.

1.10 An example of information provision is the need for ATC to immediately notify the RCC when an aircraft on radar disappears from the radar display and this is not due to surveillance performance. All information (civil/military) including video playback by ATC should be provided to RCC to enable efficient planning of the SAR Operations. Therefore, it was considered necessary to strengthen the provisions of Annex 12 paragraph 5.1.1. to refer to 'any State organization or airline' being able to be compelled to provide information to RCCs when required.

Issue 4: Multiple FIR Searches

1.11 Although the situation with MH370 was unusual in that it is unclear how the search for the aircraft should be undertaken when multiple Flight Information Regions (FIRs)/Search and Rescue Regions (SRRs) were potentially involved. It is clear that Viet Nam had initial responsibility for activation of SAR phases and the early search, as the aircraft's last known position was entering the Ho Chi Minh FIR.

1.12 However as more information came to light and the search was widened, the search began involving more SRRs, and Malaysia as the State of Registry (and having had the aircraft apparently transit back through its airspace) essentially took over the search, though the protocols under Annex 12 were unclear.

1.13 Later, Australia took over from Malaysia as being responsible for the later portion of the SAR response. Moreover, it is not uncommon for searches to be conducted across SRR boundaries in any search.

1.14 Therefore, the APSAR/TF considered it necessary that further guidance in Annex 12 was required regarding multiple SRR searches and a <u>change/transfer in responsibility</u> for the search. The following is an excerpt from the APSAR/TF/WP05:

2.5 f) Annex 12 had no reference in paragraph 5.2.4 as to responsibility when more than two SRRs are involved, especially if the airspace concerned was not part of the original flight plan.

Issue 5: Search and Rescue Region (SRR) Designation

1.15 At present with regard to the establishment of SRRs, Annex 12 states:

2.2.1 Contracting States shall delineate the search and rescue regions within which they will provide search and rescue services. Such regions shall not overlap and neighbouring regions shall be contiguous.

Note 2.— The delineation of search and rescue regions is determined on the basis of technical and operational considerations and is not related to the delineation of boundaries between States.

1.16 Therefore, the responsibility for designating ('delineating') each State's aeronautical SRR was to be determined by the States themselves, on the basis of their operating capability. It is noteworthy that there were are few Asia/Pacific SRRs in the past that were also approved by the ICAO Council through a Proposal for Amendment (PfA) to the Air Navigation Plan (ANP), but the vast majority were simply notified or amended by the State Aeronautical Information Publication (AIP).

1.17 However, In the process of developing the electronic Regional Air Navigation Plan (eANP), the ICAO Council had recently changed the manner in which SRRs were designated. Now, SRRs were supposed to be part of Volume 1, which required the Council's approval. Therefore, the approval process for the eANP and the provisions of Annex 12 appear to contain different provisions for the establishment of SRRs.

1.18 The APSAR/TF/3 had noted the problems of 'grey areas' between aeronautical SRRs [and between maritime and aeronautical SRRs] adding to the confusion following the loss of MH370. The following is an excerpt from the APSAR/TF/WP05:

2.5 g) Aeronautical SRR designation by States instead of the ICAO Council was not optimal, but this would require changes to SARPs and a complete review of the current situation to resolve and optimize the SRRs.

1.19 As it transpires, Council approval of SRRs may not be a negative, as the Council may be able to rationalise and improve SRR boundaries in the future, in order to minimise current grey areas or overlaps in responsibility (despite Annex 12 paragraph 2.2.1 clearly stating that such gaps and overlaps were not permitted). However, the provisions of Annex 12 in this regard need to align with the Council's direction so that States do not continue to designate SRRs themselves regardless of the eANP.

Conclusion

1.20 The Asia/Pacific Region had conducted extensive analysis of tragic recent events and identified a number of important updates necessary for Annex 12 (and probably consequential amendments for other documents). The Twenty Sixth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/26, Bangkok, Thailand, 7to 10 September 2015) agreed with the following Conclusion to urge key stakeholders to make appropriate changes:

APANPIRG Conclusion 26/21-2 SAR Lessons Learnt

That, considering the implications for Search and Rescue standards from recent events which required initiation of SAR actions, ICAO, in coordination with the IMO through the ICAO/IMO Joint Working Group on Harmonisation of Aeronautical and Maritime SAR (JWG), should consider urgently updating global SAR documents from the lessons learnt.

1.21 However, to date, the Asia and Pacific Regional Office are aware of considerations to amend Annex 12 that only partly reflect the lessons learnt from the recent SAR tragedies. Therefore, it is important for bodies such as the JWG to consider a more comprehensive amendment to Annex 12 that takes into account these lessons, and the advent of the Global Aeronautical Distress Safety System (GADSS).