



Agenda Item 9: SAR

ASIA/PACIFIC SAR STATUS

(Presented by the Secretariat)

SUMMARY

This paper presents information on the Asia/Pacific State Search and Rescue (SAR) status for review and update, and consideration of trans-regional SAR activities.

1. INTRODUCTION

1.1 The Second Meeting of the Asia/Pacific Regional Search and Rescue Task Force (APSAR/TF/2, Singapore, 27-31 January 2014) was attended by 37 participants from ICAO Asia/Pacific SAR Administrations, ICAO and the International Maritime Organization (IMO).

2. DISCUSSION

Asia/Pacific SAR Status

2.1 During the APSAR/TF/3 meeting, ICAO presented information on the status of SAR information in the Asia/Pacific Region known to the ICAO Regional Office, including the:

- a) SAR Capability Matrix Table (excerpt **Attachment A**);
- b) List of SAR Agreements (excerpt **Attachment B**); and
- c) SAR Agreement Matrix (excerpt **Attachment C**).

2.2 Details of trans-regional SAR arrangements between the following States are unknown:

- a) Afghanistan – Turkmenistan, Uzbekistan and Tajikistan;
- b) China – Tajikistan, Kyrgyzstan, Kazakhstan, Russian Federation
- c) Mongolia - (it is understood there is a SAR LOA with the Russian Federation);
- d) DPRK – Russian Federation; and
- e) Japan – Russian Federation.

2.3 The regional overview (**Figure 1**) indicated significant Annex 12 compliance weaknesses in South Asia and the Southwest Pacific areas, and some weaknesses in Southeast Asia and the Democratic People's Republic of Korea. Improvements were noted in French Polynesia, Maldives, Mongolia and Sri Lanka since APSAR/TF/1.

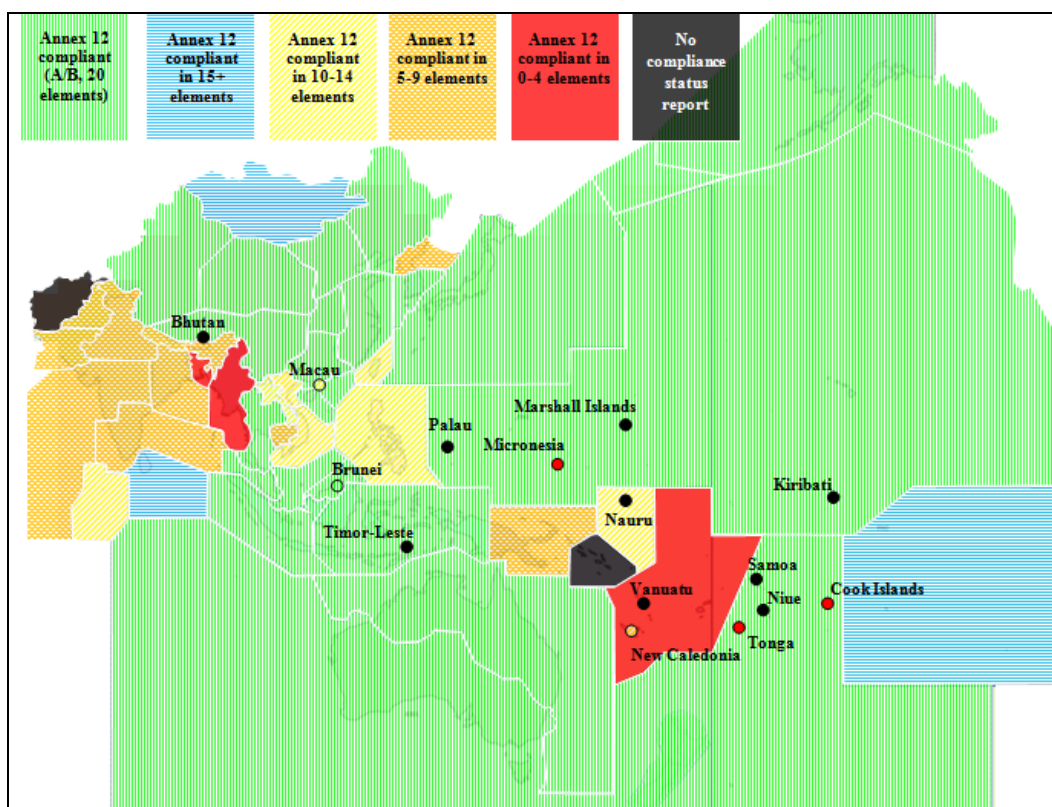


Figure 1: Asia/Pacific Regional SAR Overview

2.4 MH370 SAR Response – JRCC Australia

2.5 Australia provided a detailed update overview to the ATM/SG/2 of the Australian SAR response to Malaysia Airlines Flight MH370 which went missing following its departure from Kuala Lumpur, Malaysia, for Beijing, China on 08 March 2014. It also provided a comparison from a SAR perspective between the MH370 incident and the Air France Flight AF447 incident of 2009 and invited States involved in the MH370 incident to consider providing inputs to ICAO for any improvements to the global and regional SAR system.

2.6 Australia noted that an analysis of radar data and subsequent satellite communication (SATCOM) system signalling messages placed the aircraft in the Australian SAR Region (SRR) along an arc in the southern part of the Indian Ocean. This arc was considered to be the location where the aircraft's fuel was exhausted. Numerous challenges presented to the search operation. These included:

- a) lack of available and accurate position data about MH370's actual flight;
- b) no distress beacon detections (ELT or others carried on board);
- c) operations with long transits in remote oceanic areas offshore;
- d) 10 days elapsed before the search commenced within the Australian SRR;
- e) tropical cyclones and poor weather;
- f) lack of availability of ship-borne helicopters to investigate sightings;
- g) time required for satellite imagery analysis before tasking SAR assets;
- h) multinational civil/military cooperation, coordination and communications issues;
- i) pressure from the media and need to present a large amount of information online;

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- j) large amounts of sea pollution causing difficulty distinguishing possible debris;
 - k) availability of a detailed description of aircraft cargo and likely floating components;
 - l) sustaining large logistical requirements such as air search observers, fuel, etc.; and
 - m) lack of clearly defined division of responsibilities between the search and rescue function (Annex 12) and the air accident investigation search and recovery function (Annex 13).

2.7 Australia noted in answer to a query that they had successfully managed to deal with the extreme workload over many days because they had developed a number of ad hoc bodies to effectively delegate specific tasks and research work. Australia stated that they were very grateful for the tremendous assistance from the other States and organizations they had received.

2.8 Australia presented a detailed overview of the Underwater Locator Beacon (ULB) detections and the Towed Pinger Locator (TPL) system deployments, noting that the acoustic search was supplemented using sonobuoys dropped by Australian AP-3C aircraft with an ability to detect ULB signals. No acoustic detections considered to be related to ULBs were detected. An independent review of the acoustic signals recorded by the Australian *Ocean Shield* vessel determined the signals were not consistent with the nominal performance standards of the ULB and noted, whilst unlikely, the signals could be consistent with a damaged ULB. Moreover, they noted that the detections from the Chinese vessel *MV Haixun 01* were unlikely to be from MH370 due to seafloor depth, surface noise and the equipment used.

2.9 It was decided that an ocean floor sonar search was in progress. An underwater sonar survey using an autonomous underwater vehicle (AUV) started on 14 April 2014 with 30 missions completed searching an area of 860 km² with nil debris or wreckage detected. Further work was being conducted to determine the likely source of the *Ocean Shield* acoustic detections. Further collaborative work has continued to refine the analysis of both the flight and satellite data by an international team of specialists from the UK, USA and Australia working both independently.

2.10 A priority area of approximately 60,000 km² had been derived (which was subject to search from Day 21 to Day 26). Bathymetry analysis of the ocean floor in areas of this search zone commenced in mid-May. An intensified deep-water search was planned to commence in August 2014 for a period of up to 12 months.

2.11 The ATM/SG/2 recalled that the search for Air France Flight AF447 which crashed into the Atlantic Ocean in 2009 was of a significant scale and presented many challenges. During the search operation for MH370, Australia had taken note of the valuable experience, lessons learned and recommendations provided in regard to AF447. The MH370 incident was a scenario not previously experienced by the global SAR community, and it was a highly valuable opportunity to the global SAR community to not only share the experiences and any lessons learned from all the States involved in the SAR response, but to also improve the existing SAR system where appropriate.

2.12 Australia noted that Annex 12, Search and Rescue, Recommendation 5.9.2 reiterated that RCCs should prepare appraisals of actual SAR operations, and submit these to ICAO for information and dissemination as appropriate. The MH370 operation was continuing and pending investigation, so States who were involved in the recovery effort may not yet be in a position to collate lessons learned and opportunities for improvement. Notwithstanding this, any useful lessons that are already self-evident should be discussed to urgently improve SAR systems where possible and enhance the Asia/Pacific SAR Plan before its completion.

2.13 In that regard, ICAO outlined a number of discussion issues as follows that the MH370 event had highlighted, which needed to be discussed by the APSAR/TF and possibly incorporated into the Asia/Pacific SAR Plan and/or global SAR material.

- **CIVIL/MILITARY:** It was apparent that a higher degree of civil/military coordination may have revealed the possibility of the MH370 course reversal much earlier after the initial alert advice from Viet Nam ATC, and saved as much as a week of fruitless searching in the wrong area, while reducing the chances of finding the ULB given its limited battery life.
- **SAR PHASES:** 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 issuance of an INCERFA SAR phase, and 7 hours and 21 minutes for the issuance of an ALERFA/DETRESFA SAR phases indicated that the Annex 12 SAR phases and actions may need to be revised to take into account the expectations and capabilities of a modern ATS surveillance environment (the SAR phases were designed in a procedural environment). The SAR actions should include the need for civil/military coordination where appropriate, and advisories to all neighbouring ACCs in the case of uncertainty of the aircraft's track.
- **SAR PREPAREDNESS:** Poor SAR preparedness and ad hoc SAR coordination between States needed to be addressed. Past APANPIRG Conclusions meant to address SAR coordination weaknesses had been largely ignored. In some cases SAR Agreements were hindered by political barriers whereby States can take many years to progress documents through government ministries. This may require a high level political agreement to change the manner in which SAR agreements and operational coordination is prioritized and managed. In addition, the region needs to conduct properly organized SAREX that actually test the SAR system on a regular basis and report the outcomes to APANPIRG, instead of this being done on an ad hoc basis between States.
- **ANNEX 12/13 TRANSITION:** Annex 12 and Annex 13 needed to be updated to include SARPs on transition procedures between the two Annexes, particularly regarding who is responsible during concurrent Annex 12 and Annex 13 activities (i.e.: who is responsible for a rescue operation and when that phase ends, so it became primarily a recovery/investigation operation under Annex 13).
- **MULTIPLE SRRS/FIRS:** Annex 12 had no reference in paragraph 5.2.4 as to responsibility when more than two SRRs were involved, especially if the airspace concerned was not part of the original flight plan.
- **SRR DESIGNATION** Aeronautical SRR designation by States (as it is written in Annex 12 at present) instead of the ICAO Council was not the most optimal method, and did not align with the process used to designate FIRs; thus there were areas where there was an overlap of SAR responsibility or no clear responsibility.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) update the SAR status and SAR Contact List (**Attachment D**) as applicable; and
- c) discuss any relevant matters as appropriate.

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SAR Capability Matrix Excerpt (Last Update: 11 August 2014)

	Training	Alerting	Legislative	SAR Committee	SAR Agreements	Relationships	Communications	Quality Control	Civil Military	Resources	SAREX	Library	Computerisation	SAR Programme	Supply Dropping	Special Equipment	SAR aircraft	Navigation	ELTs	COSPAS-SARSAT Alerts
Afghanistan																				
China	A	A	A	A	A	A	B	B	A	B	B	C	D	E	A	A	A	A	A	E
DPR Korea	D	B	D	B	E	D	B	B	B	C	D	E	E	E	D	E	C	C	E	E
Japan	A	A	A	A	B	A	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Mongolia	C	A	B	C	B	B	A	A	A	B	A	A	A	B	D	B	A	B	A	A
Republic of Korea	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
United States	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

A = Fully meets Annex 12 requirements

B = Meets Annex 12 requirements in most areas

C = Meets Annex 12 requirements in some areas

D = Initial implementation

E = Not implemented

Blank = No response

SAR Matrix Element Descriptions

Training: The appropriate level and type of training for SAR coordinator, SAR mission coordinator, on-scene coordinator, and operational facilities. (IAMSAR Manual Vol. 1, Chapter 3)

Alerting: Fast and reliable means for the rescue coordination center to receive distress alerts. (IAMSAR Manual Vol. 1, Chapter 2)

Legislative: Statutes and related provisions that establish a legal foundation for establishing a SAR organization and its resources, policies, and procedures. (IAMSAR Manual Vol. I, Chapter 1)

SAR committee: Typically established under a national SAR plan, the SAR coordinating committee is comprised of SAR system stakeholders. (IAMSAR Manual Vol. 1, Chapter 6 and Appendix J)

Agreements : States should enter into agreements with neighboring States to strengthen SAR cooperation and coordination. (Chapter 3 – *Cooperation*, in both Annex 12 – Search and Rescue, and the International Convention on Maritime SAR)

Relationships: Close cooperation between services and organizations which may contribute to improving SAR service in areas such as operations, planning, training, exercises and research and development.

Communications: Communication capability for receipt of distress alerts and operational coordination among the SAR mission coordinator, the on-scene coordinator and SAR facilities. (IAMSAR Manual Vol. 1, Chapter 3)

Quality Control: Procedures to focus on improving the quality of SAR services so as to improve results and reduce costs. (IAMSAR Manual Vol. 1, Chapter 6)

Civil/Military: Close cooperation between the various civilian and military organizations.

Resources: The primary operational facilities made available to the national SAR system by various authorities and arrangements with others. (IAMSAR Manual Vol. 1, Chapter 5 and Appendix C)

SAR Exercise: Exercise to test and improve operational plans, provide learning experience and improve liaison and coordination skills. (IAMSAR Manual Vol. 1, Chapter 3; Annex 12, and Annex 14 regarding Airport Emergency Plan)

Library: Quick access to the applicable international, national, and agency SAR publications that provide standards, policy, procedures and guidance.

Computerization: Use of or access to output of various computer resources including databases, computer aids for SAR system management, search planning software, etc. (IAMSAR Manual Vol. 1, Chapter 2)

SAR programme: National structure to establish, manage and support the provision and coordination of SAR services. (IAMSAR Manual Vol. 1, Chapter 1)

Supply dropping: Supplies and survival equipment carried by air and maritime SAR facilities to aid survivors and facilitate their rescue, as appropriate. (IAMSAR Manual Vol. 1, Chapter 2 and Appendix B)

Special equipment: Equipment created for specific rescue scenarios (such as mountain or desert rescue) and equipment typically carried on designated SAR units to support coordination and locating functions as well as special supplies and survival equipment to aid survivors and facilitate their rescue. (IAMSAR Manual Vol. 1, Chapter 2 and 4)

SAR aircraft: An aircraft provided with specialized equipment suitable for the efficient conduct of SAR missions (Annex 12, Chapter 2 - *Organization*)

Navigation: Suitable means provided within the SAR region to determine position, and the responding SAR facilities have the appropriate equipment on board to determine their position in the SAR region they are likely to operate. (IAMSAR Manual Vol. 1, Chapter 2)

ELT: National regulations for carriage of ELTs, and arrangements for registration of the 406 MHz beacon and rapid access to the beacon registration database. (Annex 6 – Operation of Aircraft and Annex 10 - Aeronautical Telecommunications; and IAMSAR Manual Vol. 1, Chapter 4)

Cospas-Sarsat Distress Alerts : A SAR Point of Contact (SPOC) designated for receipt of Cospas-Sarsat distress data, and arrangements for efficient routing of the distress data to the appropriate SAR authority (the aeronautical emergency locator transmitter ELT), maritime emergency position-indicating beacon (EPIRB), and personal locator beacon (PLB)). (Annex 12, paragraph 3.2.5 and Section 2.4; and, IAMSAR Manual Vol. 1, Chapter 4)

SAR AGREEMENTS EXCERPT

Updated: 04 September 2014

ID NO.	DATE	STATES	REMARKS
37	16 May 2007	China / Republic of Korea	
26	notified 2003	China / United States	
	Signed 25 Oct 2013	China/Mongolia	
38	30 April 2008	Japan / Republic of Korea	
10	1986	Japan / United States	

SAR LOA Matrix Excerpt Date Last Amended: 04 September 2014

(√ = SAR Agreement notified, blank cell = SAR Agreement not notified)

Administration	Afghanistan	China	DPR Korea	Japan	Mongolia	ROK	USA
1. Afghanistan	█	█	█	█	█	█	█
2. China	█	█	█	█	█	√	√
3. DPR Korea	█	█	█	█	█	█	█
4. Japan	█	█	█	█	█	√	√
5. Mongolia	█	█	█	█	█	█	█
6. Republic of Korea	█	√	█	√	█	█	█
7. USA	█	√	█	√	█	█	█

EAT/SCM – WP09 Attachment D

22-23/09/2014

SAR Contact List

	Name	Title/Organization	TEL/FAX/E-MAIL
1.	AUSTRALIA		
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EAT/SCM – WP09 Attachment D
22-23/09/2014

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EAT/SCM – WP09 Attachment D
22-23/09/2014

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EAT/SCM – WP09 Attachment D
22-23/09/2014

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EAT/SCM – WP09 Attachment D
22-23/09/2014

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EAT/SCM – WP09 Attachment D
22-23/09/2014

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EAT/SCM – WP09 Attachment D
22-23/09/2014

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