



International Civil Aviation Organization

**The Second Meeting of the APANPIRG ATM Sub-Group
(ATM /SG/2)**

Hong Kong, China, 04-08 August 2014

Agenda Item 6: AOP, MET, AIM, SAR

ASIA/PACIFIC SEARCH AND RESCUE TASK FORCE OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents the outcomes from the Second Meeting of the Asia/Pacific Regional Search and Rescue Task Force (APSAR/TF/2, Singapore, 27-31 January 2014).

1. INTRODUCTION

1.1 The APSAR/TF/2 meeting was attended by 37 participants from Australia, Bangladesh, Cambodia, India, Indonesia, Japan, Maldives, Mongolia, Nepal, New Zealand, Philippines, Singapore, Sri Lanka, Thailand, U.S.A., Cospas-Sarsat, IATA, the International Maritime Organization (IMO) and ICAO.

2. DISCUSSION

Africa-Indian Ocean Region SAR Services Integration Task Force

2.1 Australia presented information on efforts to improve SAR services within the ICAO Africa-Indian Ocean area through the establishment of the AFI SAR Services Integration Task Force (ASSI/TF). The ASSI/TF was established following a Decision by the 7th Meeting of the AFI Planning and Implementation Regional Group (APIRG/17, August 2010).

2.2 The objectives of the ASSI/TF were similar to those of the APSAR/TF, which provided opportunities for collaboration between both regions and harmonization of inter-regional solutions aligned with the APSAR/TF Terms of Reference (ToR). Australia suggested that it could be beneficial for the APSAR/TF and ASSI/TF to collaborate by establishing a formal line of communication or holding a joint Task Force meeting to share experiences. Moreover, Australia stated that concepts and outcomes from the ASSI/TF may be useful for consideration in development of the Asia/Pacific Regional SAR Plan.

2.3 The ASSI/TF/3 meeting noted that a joint meeting with the APSAR/TF would be of great benefit to the ASSI Task Force, as the Asia/Pacific Region was more advanced in terms of SAR services provision.

2.4 The Chairperson espoused the possible advantages of sub-regional SAR services, especially for those States that did not have the resources to operate a full RCC, or States that sought a greater efficiency by pooling resources with their neighbours.

2.5 The International Maritime Organization (IMO) noted that they had established five ‘Regional’ Rescue Coordination Centres (RCCs) in Africa based on a sub-regional model in Kenya, South Africa, Nigeria, Monrovia, and Morocco. The RCCs in other States within the sub-regions were termed ‘Associated’ RCCs. The United States fully supported the concept of sub-regional SAR services. The Secretariat noted the close working relationship between Cambodia, Lao PDR and Viet Nam at a recent SAR Exercise (SAREX), which could form the basis of a future sub-regional RCC development.

The ICAO/IMO Joint Working Group on SAR

2.6 The United States provided an update on relevant information from the Twentieth Session of the ICAO/IMO Joint Working Group (JWG) on SAR (JWG 20, Amsterdam, the Netherlands, 23 to 27 September 2013). The IMO is a United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships. IMO’s Maritime Safety Committee (MSC) was responsible for the development of regulations, recommendations and guidelines related to SAR.

2.7 JWG 20 supported the need to improve the ‘Sample SAR Coordinating Committee Agreement’ and ‘Sample SAR Agreement’ appendix, and would review the proposal emanating from the APSAR/TF for incorporation into the International Aeronautical and Maritime SAR (IAMSAR) Manual. JWG 20 agreed that a SAR global web site would be beneficial to the SAR community.

2.8 JWG 21 (22-26 September 2014, Bangkok, Thailand) was expected to discuss a proposed list of documents and publications which should be held by an aeronautical, a maritime and a joint Rescue Coordination Centre (RCC, both aeronautical and maritime).

2.9 From IMO’s perspective it was better for Asia/Pacific States to present papers through the ICAO Regional Office and the Air Traffic Management Sub-Group (ATM/SG), instead of directly to ICAOHQ. The United States noted that the JWG could be overwhelmed by individual submissions, so preferred information to come through an APANPIRG task force. The Secretariat agreed that the ATM/SG needed to be strengthened with the participation of more SAR specialists.

2.10 The United States noted that weaknesses in the IAMSAR regarding land SAR responses were being addressed at the JWG. ICAO stated that civil-military cooperation in SAR also needed to be considered.

2.11 The Chairperson noted previous significant Asia/Pacific SAR events had been discussed at previous ATM/SG meetings with outcomes including several lists of recommendations for improving SAR capability within the Region. Though numerous efforts were obvious, a disjointed lack of focus in following up recommendations was evident. ICAO briefed the meeting on the new performance-based environment, in which a regional picture would be available on an Internet-based platform, showing the progress of various Aviation System Block Upgrade (ASBU) elements. Unfortunately SAR was not yet part of ASBU, but the Asia/Pacific SAR Plan would provide an opportunity for each Plan element to be treated in the same manner as ASBU elements.

2.12 Regarding SAREX, India noted that they conducted regular maritime SAREX. The meetings discussed whether there needed to be a schedule of SAREXs, which seemed to be conducted on an ad hoc basis or based on irregular bilateral arrangements. ICAO noted that some SAREX do not actually test the SAR system, but are rather crash fire exercises. Singapore stated that they conducted SAREXs, both table top and real deployment annually. The Maldives, India and Sri Lanka advised that they were now conducting annual SAREX.

Cospas-Sarsat Status Report and Operational Statistics

2.13 Cospas-Sarsat presented the current status of the Cospas-Sarsat System – Cosmicheskaya Sistema Poiska Avariynykh Sudov (Космическая Система Поиска Аварийных Судов, or ‘Space System for the Search of Vessels in Distress) Search And Rescue Satellite-Aided Tracking. The paper provided statistics on System performance and the performance of users of the System, including System operations, space and ground segments, beacons, false alerts and results of Cospas-Sarsat Mission Control Centre (MCC) – SPOC communication tests.

2.14 In 2012, based on preliminary information, Cospas-Sarsat alert data assisted in 634 distress incidents and 2,029 persons were rescued. The distribution of all SAR events (maritime, aviation and land) during 2012 is shown at **Figure 1**. The use of Personal Locator Beacons (PLBs) increased from 28% of the total SAR events in 2011 to 30% in 2012.

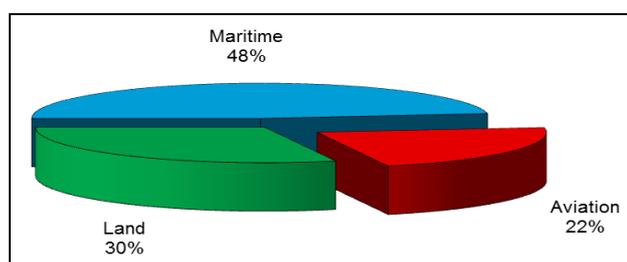


Figure 1: Type of SAR Events (2012).

2.15 **Figure 2** shows the number of SAR events and persons rescued with the assistance of Cospas-Sarsat alert data for the period from January 1994 to December 2012.

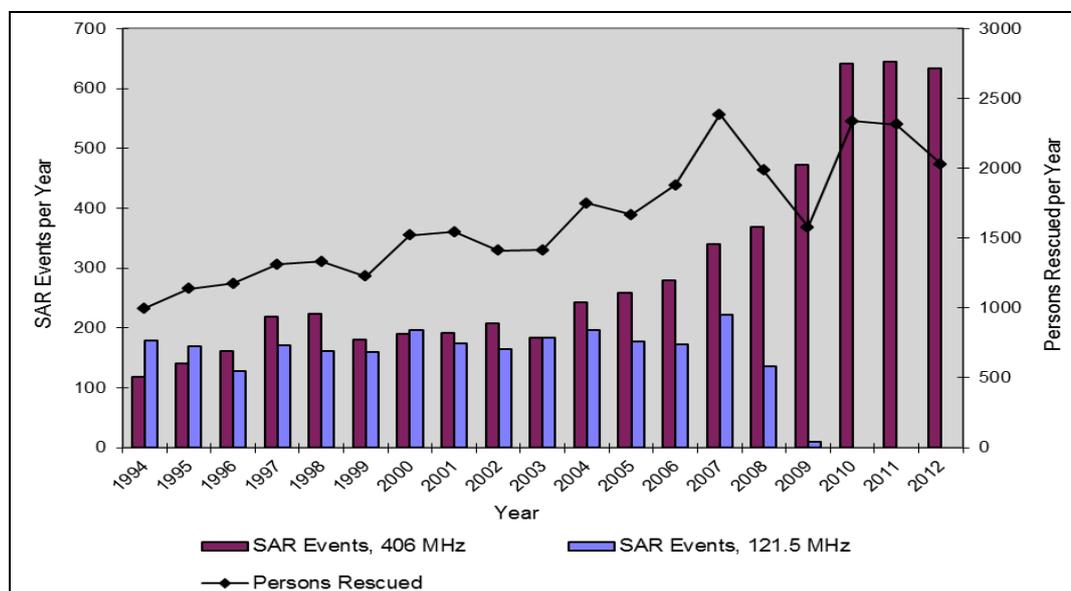


Figure 2: SAR Events/Persons Rescued with Cospas-Sarsat Alert Assistance (1994 – 2012)

2.16 Cospas-Sarsat observed that:

- Aircraft Emergency Locator Transmitters (ELTs) false alert rates were higher at 4.9% than those of maritime Emergency Position Indicating Radio Beacon (EPIRB) and personal locator beacons (PLBs), and that efforts should be made to reduce these false alert rates;

- ELT beacon-registration rates were somewhat lower than the rates for EPIRBs and PLBs, and that efforts should be made to improve ELT beacon-registration rates (in 2012, 65.8% of beacons detected were registered);
- beacon registration should be made as easy as possible for beacon owners in order to encourage registration, and that during a distress alert having registration information available not only improved the probability of a successful rescue, but could also reduce the needless use of critical SAR resources;
- administrations were encouraged to make use of the free Cospas-Sarsat International Beacon Registration Database (IBRD) if they needed such a resource;
- the Asia-Pacific region generally had a good response to SPOC test calls..

2.17 Cospas-Sarsat commented that papers had been presented at past forums on the necessity for PLB registration. The United States stated that some States had a problem with PLBs – which did not fall under an administration such as ICAO for ELTs and IMO for EPIRBs. The meeting noted the increasing miniaturisation of PLBs, even in watches, and that Cospas-Sarsat would send an alert automatically no matter what the source; thus a State had an obligation to act. The IMO was concerned about the possibility of PLBs featuring in watches could swamp the SAR alerting system, and overload RCCs. India suggested PLB registration at the point of sale.

2.18 The APSAR/TF/2 noted and shared the view of IMO's COMSAR 17 meeting (January 2013) that the coding of second-generation beacons should provide reliable, accurate, timely and complete information to SAR authorities. Moreover, it was considered that a simplified beacon coding system for next generation beacons should include potential use of the country code, Cospas-Sarsat Type Approval Certificate (TAC) number and a serial number as a beacon unique ID (TAC number, serial number + country code), provided provision was also made for transmission of the vessel/aircraft identity (aircraft tail number/Maritime Mobile Service Identity (MMSI) number). Minimum Operational Performance Specifications for second-generation 406-MHz ELTs were being developed by the EUROCAE Council.

2.19 The meeting noted that unless there was a worldwide agreement to ban PLBs, it was necessary to urgently address and manage issues of systems capacity and system distribution (such as PLB alerts going to a local police agency). The meeting agreed to the following Draft Conclusions.

Draft Conclusion APSAR/TF/2-1: Cospas-Sarsat Alert Responses

That, considering the importance of effective Cospas-Sarsat alerting and monitoring supporting the international Search and Rescue (SAR) system, States be urged to:

- a) consider becoming formally associated with the Cospas-Sarsat system;
- b) provide up-to-date SAR Point of Contact (SPOC) details to Cospas-Sarsat, and respond promptly to SPOC communications tests;
- c) promote registration of 406 MHz distress beacons and make use of the free International Beacon Registration Database (IBRD) facility unless the State has its own readily available registration system;
- d) support a, simplified, serialised beacon unique identification coding system for next generation beacons;
- e) ensure the provision of immediate access by Rescue Coordination Centres (RCCs) to the 406 MHz distress beacon registration data, whether maintained by the State or the Cospas-Sarsat IBRD; and
- f) provide post-alert advisories to Cospas-Sarsat on all alert outcomes as soon as practicable as a performance and system improvement measure.

Draft Conclusion APSAR/TF/2-2: Personal Locator Beacon Regulation

That, considering the development of miniaturised Personal Locator Beacons (PLBs) being increasingly carried on persons, marine vessels and aircraft, the possible overload of alerting systems and RCCs, and the obligation of States to respond to safety alerts, ICAO HQ, in cooperation with the IMO, be urged to consider:

- a) registering PLBs, (preferably at the point of sale); and
- b) the most efficient and uniform means of directing PLB alerts not originating from marine vessels or aircraft to other appropriate public policing or emergency services.

Cospas-Sarsat Developments for Future System Enhancements

2.20 Cospas-Sarsat provided an extensive overview of Cospas-Sarsat developments, such as the current Demonstration and Evaluation phase of Medium-altitude Earth Orbit Search and Rescue (MEOSAR) spacecraft payloads, and the specifications for the second generation of Cospas-Sarsat beacons, including potential new features for 406 MHz ELTs.

2.21 The following Asia/Pacific States had planned to implement a MEOSAR ground segment: Australia, China, India, Japan, New Zealand, Pakistan, Singapore, and Thailand. The MEOSAR is currently comprised of 12 Global Positioning Satellites (GPS), one Glonass-K satellite (Глобальная навигационная спутниковая система – Globalnaya Navigatsionnaya Sputnikovaya Sistema) with an L-band downlink, and two Galileo satellites with operational L-band SAR payloads.

2.22 The launch of the first two of a planned 22 Galileo satellites with SAR payloads is planned for mid-2014. Further Galileo launches were planned to reach a full deployment of 28 satellites by the end of 2018. A Glonass-K2 had a planned launch date in early 2014.

2.23 Regarding second-generation ELTs automatically activated in-flight, the Experts Working Group (EWG-1/2013) agreed in principle to include future ICAO requirements related to in-flight distress alerts that could provide useful location data in advance of an aircraft accident. The prediction-accuracy target for the crash location using this system was six nautical miles (NM). Further work was required related to define location accuracy and the types of aircraft for which the requirement would be applicable, and other methods of in-flight activation, such as manually triggered beacons.

2.24 The SAR/Galileo component of the future MEOSAR system will provide a capability for a Return Link Service (RLS) uplink communications system for compatible distress beacons, with an interoperable capability under consideration for the Russian SAR/GLONASS.

Asia/Pacific SAR Status

2.25 The Secretariat presented the status of SAR information in the Asia/Pacific Region known to the ICAO Regional Office, including the:

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

2.26 The regional overview (**Figure 3**) 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. The United States commended the Regional Office for its work on the regional picture, stressing that honest reporting of status by States was important to ensure changes and resources were made available for SAR improvement.

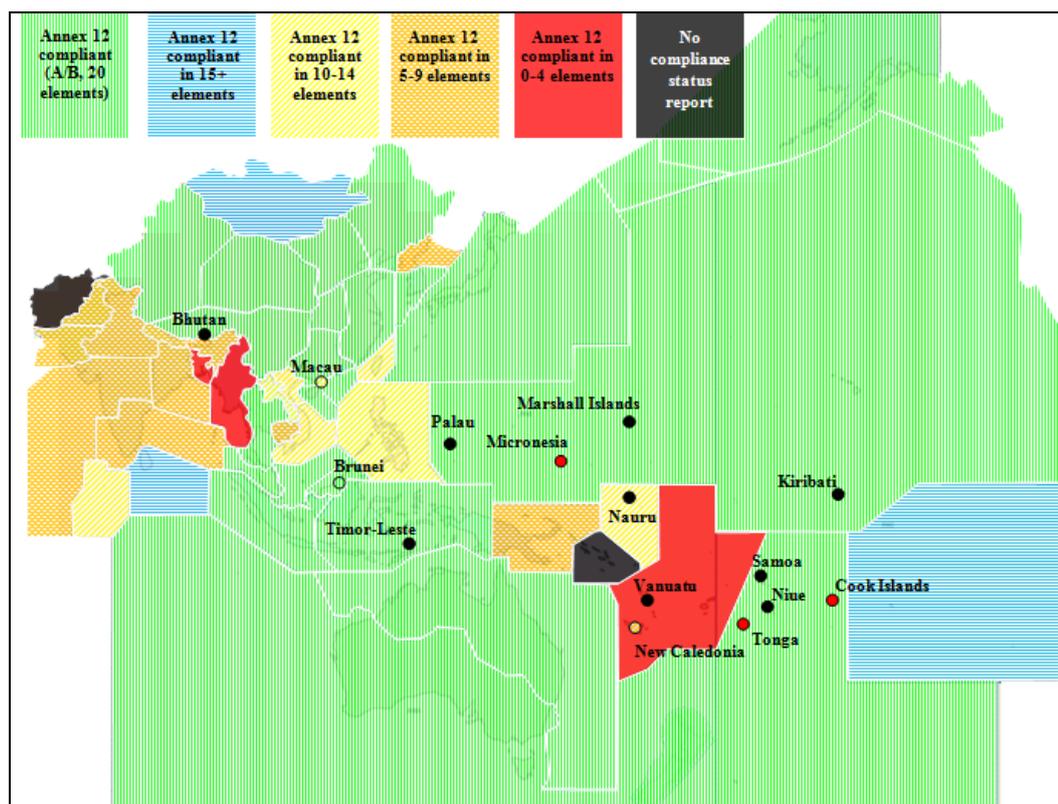


Figure 3: Asia/Pacific Regional SAR Overview

SAR Technical Officer at ICAO Headquarters

2.27 The United States noted that ICAO Headquarters Montreal did not have a dedicated SAR technical officer, and that the ICAO/IMO JWG was concerned about this lack of SAR resource. The United States requested the APSAR/TF to discuss the implications, if any, upon SAR services within the region (especially inter-regional planning, coordination and cooperation).

2.28 The United States noted that it was appropriate for regional offices to have increased responsibility for SAR within their region, but it was also proper that differences between regions were correctly handled and that there was a focused global oversight. Moreover, they stated that the burden for SAR had shifted to the air traffic management (ATM) section in each regional office; however, this section also normally had a heavy, broad workload.

2.29 Australia agreed with the intent of the paper, noting that SAR had been left out of the ASBU and supported a dedicated SAR Technical Officer to provide a greater focus on SAR issues at HQ. Singapore supported the idea of a dedicated officer coordinating the global SAR effort. Sri Lanka stated that they were of the view that a permanent SAR officer should be established at ICAOHQ and agreed with the paper, noting the traffic growth in the region. The meeting agreed to the following Draft Conclusion.

Draft Conclusion APSAR/TF/2-3: Global SAR Coordination

That, considering the need for global and inter-regional Search and Rescue (SAR) coordination, ICAOHQ be urged to:

- c) review the lack of a dedicated technical officer responsible for managing global SAR policy development and inter-regional coordination; and
- d) include SAR as part of the Aviation System Block Upgrades (ASBU).

Establishment of an Asia-Pacific SAR Library

2.30 The United States announced that it would develop a SAR library on a web site that would be available to other national SAR authorities. Input was requested from the APSAR/TF members to resolve some implementation details, particularly regarding documents specific to the Asia/Pacific region and the structure of the web site. The goal was to provide a site from which any SAR authority could access SAR documents and publications or serve as verification that the RCC/Rescue Sub-Centre (RSC) or SPOC had access to them.

2.31 Documents on the web site would not include those publications which are purchased. Those posted would be what IMO refers to as ‘unpublished documents’ (non-copyright and thus were available for free). However, consideration would be given to posting extracts of certain IMO and/or ICAO documents, such as large ICAO annexes with only small sections applicable to SAR.

2.32 The Maldives discussed the issue of document updates and the problem of copyrighted documents. IMO noted they could link the documents but not the IAMSAR, which was a chargeable resource. Singapore asked the United States to include the Cospas-Sarsat Handbook on the website. The meeting noted that current document version details should be shown on the website. The global coordination to support the Library was observed by the meeting as an example of why ICAOHQ SAR oversight was needed. The meeting agreed to the following Draft Decision:

Draft Decision APSAR/TF/2-4: Search and Rescue (SAR) Library

That, States be urged to utilise the SAR Library located at
http://www.uscg.mil/hq/cg5/cg534/nsarc/Intl_SAR.asp.

Pacific SAR Cooperation

2.33 Since 2001 the Secretariat of the Pacific Community (SPC), at the behest of regional leaders and those countries with established search and rescue regions (SRRs), had been working to strengthen SAR policy, cooperation and coordination, and more recently to harmonize aeronautical and maritime SAR in the Pacific Islands region. These activities include regional SAR workshops; collection, analysis and dissemination of regional SAR data; and the development of a regional maritime SAR technical arrangement for cooperation.

2.34 The Technical Arrangement for Cooperation among Pacific Island countries and territories that Support International Lifesaving in the Pacific Ocean (TAfC) was designed to identify maritime SAR geographic boundaries, establish a framework for new and existing bi- and multi-lateral SAR arrangements, and encourage improvements in maritime SAR coordination, communication, cooperation and planning. Additionally the TAfC would help to ensure consistency across the Pacific region and between PICTs that were signatory to the 1979 SAR Convention and those that were not. The TAfC did not supersede existing SAR legislation, plans or arrangements within Pacific SRRs (**Figure 4**).

2.35 New Zealand noted the significant improvement in Pacific cooperation, and in particular the fusion of aeronautical and maritime SAR efforts. The meeting recognised the work done between Australia and France/New Caledonia in reaching an operational agreement to provide SAR services within a shared maritime SRR, noting that where SRRs contained shared areas of responsibility or where aeronautical and maritime SRRs were not coincident, that States must have clear coordination arrangements within their SAR agreements to avoid any potential for confusion during an actual SAR incident.

Dealing with Certification for SAR

2.36 The APSAR/TF considered the concept of certification as a means to evaluate the capability and maturity of SAR organizations and their compliance against Annex 12 requirements. The meeting noted the importance of internal Safety Management System (SMS) and Quality Assurance (QA) being incorporated within RCCs and other SAR systems.

Peer Review Process

2.37 The meeting discussed coordination between States to improve SAR arrangements through the exchange of lessons learnt and good practices. IATA suggested the concept of ‘Go Teams’ (normally comprised of experts from International Organizations, the aviation industry and States) used to improve Performance-based Navigation (PBN) implementation might be applied to SAR. The intention was to up-skill ‘champion States’ so that improvements could flow to other States. The meeting agreed that it was a useful proposal, and requested the Secretariat to follow up with ICAOHQ on the suggestion.

Non Detection of ELT - Helicopter Accidents

2.38 India noted a phenomenal growth in helicopter operations registered for general aviation, VIP movement and oil exploration in India, and that most of the helicopters were operated at low levels in VFR or Special VFR conditions, resulting in a number of accidents. They observed that locating such accident sites were often difficult due to the non-activation of ELTs and the remote accident sites. The meeting discussed the delay that sometimes occurred in locating a helicopter accident site of because of the non-activation of ELT due to:

- a) impact forces less than 2G (particularly when the aircraft is over dense forest); or
- b) ELT antenna being detached or the ELT being destroyed in the impact and fire; or
- c) immersion of ELT or antenna in water.

2.39 The meeting noted that systems such as satellite tracking systems could be used to supplement the use of ELTs. Cospas-Sarsat noted that they had been compiling information on this problem, which regularly involved antenna detachment. The Cospas-Sarsat Programme was evaluating specification options for a more robust system, including in-flight activation and manufacturer introduction of ELTs with an internal, secondary antenna.

2.40 Singapore recalled that Cospas-Sarsat was exploring the possibility of second generation beacons have an in-flight activation capability. New Zealand noted their experience in heavily forested areas where beacon activation was not always successful. India suggested that supplementary devices able to conduct satellite tracking that could record route information like ‘Spider Tracks’ needed to be considered. IATA recalled that ADS-B was also a means of tracking aircraft for SAR.

2.41 It was observed by some participants that the 50 second delay specified before the first 406 MHz beacon burst may not be appropriate in aviation distress incidents, and that a more ‘intelligent’ transmission scheduling arrangement might be necessary. The meeting noted that in discussing the requirements for in-flight activation, such requirements should be discussed by airlines, manufacturers, regulators and ANSPs (for possible integration into ATC systems), as well as noting the possible emergence of satellite-based ADS-B which might reduce the need for in-flight activation. New Zealand advised that there had been a request by the aviation industry for light aircraft to use flight tracking instead of ELTs. They noted that the commercial flight tracking systems appeared to work effectively.

Review IAMSAR SAR Agreement Template

2.42 Singapore and the United States presented a regional draft template for a SAR Agreement for consideration by the APSAR Task Force. It was recognized that many States have difficulties in enacting SAR agreements with their neighbouring States. The APSAR/TF tasked itself to develop a SAR Agreement and requested assistance in creating a sample SAR Agreement with more details specific to regional needs than currently provided in the IAMSAR Manual, Volume I. The APSAR/TF suggested some minor improvements to the template, and noted that a member State would present it to the JWG.

Proposed Draft Regional SAR Coordinating Committee Agreement

2.43 The JWG reviewed and supported the proposed draft template, requesting that the output from the APSAR/TF/2 meeting be submitted at the next JWG session for consideration as a proposed amendment to. The APSAR/TF suggested some minor improvements to the template, and noted that a member State would present it to the JWG for incorporation into the IAMSAR Manual.

Recommendations for the Improvement of a Developing State's SAR System (WP16)

2.44 Australia presented a list of recommendations for improving a developing State's SAR system derived from an actual gap Analysis of an Asia/Pacific State, including the establishment of a basic Joint Rescue Coordination Centre (JRCC) and JRCC minimum equipment list. These recommendations were provided as an example for consideration during the development of the Asia/Pacific Regional SAR Plan. Not all recommendations may be appropriate for individual States however the list provided a basis for a customized development plan. Australia had also been requested to provide a recommended JRCC minimum equipment list to the Task Force to be considered for inclusion within the Asia/Pacific Regional SAR Plan. The meeting discussed the possibility of having different level requirements for RCCs at various stages of development.

Improving Oceanic SAR Response

2.45 The ICAO High Level Safety Conference (HLSC, Montreal, Canada, 29 March-1 April 2010) agreed that oceanic and remote area SAR required a high priority. Surveillance, flight monitoring, and communications were being considered by expert groups, including the ICAO Flight Recorder Panel (FLIRECP) Working Group, ICAO Operational Data Link Panel (OPLINKP), ICAO/IMO SAR Joint Working Group (JWG-SAR) and COSPAS-SARSAT.

2.46 Australia proposed a consolidated list of items specific to improving oceanic SAR response for consideration towards the development of the Asia/Pacific Regional SAR Plan. The items drew on the IAMSAR Manual, Volume 1, Chapter 6, Section 6.4.6 *Using international Co-operation to improve SAR services*, lessons learnt from the AF447 accident, and additional items identified in APSAR/TF/1/WP07.

Standardised Software Application for SAR Procedures

2.47 India discussed the need for developing standardized and common SAR software to support procedures for RCCs in the Asia/Pacific region to reduce the time lost for site detection and deployment of resources planning. The meeting agreed that there was great value in having a standard software package; however it was noted that at this time there were difficulties to overcome. For example, the Australian system was customised and the software was proprietary, requiring specialised training. The meeting noted that the harmonisation of data transfer processes was an area that could be considered for standardisation.

Asia/Pacific Regional SAR Plan

2.48 ICAO presented the early draft Asia/Pacific SAR Plan. According to the Terms of Reference, the APSAR/TF was expected to deliver a plan within two years of establishment for enhancement of SAR capability within the Asia/Pacific Region, including enhancement of SAR services with neighbouring States.

2.49 The APSAR/TF/2 reviewed the ‘straw man’ – an outline of the basic document with headings and some starting text. Participants were expected to discuss the structure and in particular, any missing components of the draft plan. APSAR/TF/2 should take into account relevant material from the Regional Air Navigation Plan and ICAO Assembly meetings. The early draft plan developed by APSAR/TF/2 would be presented to the ATM Sub-Group and thence to APANPIRG/25 in 2014.

2.50 APSAR/TF/3 was expected to deliberate on the plan with all its draft material in place, and take into account the trans-regional aspects such as with the African-Indian Ocean areas that adjoin the Asia/Pacific. APSAR/TF/4 was expected to complete discussions on the draft plan in preparation for presentation to the ATM Sub-Group and thence to APANPIRG/26 in 2015.

2.51 The meeting reviewed the draft Asia/Pacific SAR Plan in a methodical manner, so that participants could be apprised of the plan’s concept, structure and relevant material. The early draft plan is at **Attachment D**.

SAR Standardized Training Package

2.52 Singapore presented information on the development of the ICAO Standardized Training Package (STP) for SAR. The Singapore Aviation Academy (SAA), as part of its commitment to obtain full member status of the ICAO TRAINAIR PLUS network, developed an STP for the training of Aeronautical SAR Mission Coordinators (SMCs). The STP was endorsed by ICAO on 9 April 2012.

Date and Venue of the Next Meeting

2.53 It was proposed that the next meeting would be held from 26-30 January 2015, at the Maldives. An international SAREX was also being planned to be conducted in conjunction with this meeting.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
- a) note the information contained in this paper; and
 - b) discuss any relevant matters as appropriate.

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SAR Capability Matrix (Last Update: 25 June 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																				
Australia	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	B	A
Bangladesh	D	C	B	E	E	E	C	E	B	E	E	C	E	E	C	C	B	E	B	C
Bhutan																				
Brunei	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	A	A	A	E
Cambodia	B	B	C	B	C	B	C	E	B	C	C	C	D	C	E	E	D	D	E	B
China	A	A	A	A	A	A	B	B	A	B	B	C	D	E	A	A	A	A	A	E
Cook Islands	E	D	D	E	E	C	C	C	D	E	D	E	E	E	E	D	D	E	A	E
DPR Korea	D	B	D	B	E	D	B	B	B	C	D	E	E	E	D	E	C	C	E	E
Fiji	D	C	C	C	C	C	C	D	B	C	B	C	E	C	D	E	C	C	C	E
French Polynesia	A	A	A	B	C	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A
Hong Kong, China	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
India	B	C	C	C	D	C	C	E	C	C	C	C	C	B	B	B	C	E	A	A
Indonesia	A	B	A	A	A	B	B	B	A	B	A	B	B	B	C	B	B	B	B	B
Japan	A	A	A	A	B	A	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Kiribati																				
Lao PDR	C	B	C	B	B	B	B	D	B	B	C	C	C	C	B	D	D	B	D	A
Macau, China	A	A	A	B	A	-	A	-	-	-	A	-	-	-	-	-	A	-	A	A
Malaysia	A	A	C	A	B	A	A	A	A	A	A	B	A	A	A	B	A	A	A	D
Maldives	D	E	E	E	E	E	E	E	B	E	C	E	E	E	E	E	E	E	E	E
Marshall Islands																				
Micronesia	C	D		E	E	D	C					E		D	D					

Mongolia	C	A	B	C	B	B	A	A	A	B	A	A	A	B	D	B	A	B	A	A
Myanmar	D	E	D	C	E	B	C	C	B	E	E	E	E	E	C	E	B	C	E	E
Nauru																				
Nepal	B	B	C	D	E	C	C	D	B	D	E	D	E	B	B	C	B	B	B	D
New Caledonia	C	B	B	B	C	B	A	E	A	C	C	D	E	E	A	B	A	A	A	A
New Zealand	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Pakistan	C	C	B	B	E	B	B	C	B	C	E	E	E	E	B	E	B	B	C	A
Palau																				
Papua New Guinea	B	A	B	C	B	B	C	C	B	C	C	B	C	C	C	E	E	E	A	E
Philippines	B	B	A	B	B	B	B	C	B	C	C	B	C	C	D	D	B	A	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
Samoa																				
Solomon Islands																				
Singapore	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sri Lanka	A	A	A	A	D	B	A	B	A	B	B	A	D	B	B	B	C	B	A	A
Thailand	A	A	A	A	A	A	A	A	A	A	A	B	B	B	A	A	A	A	A	A
Timor Leste																				
Tonga	C	D	E	E	D	C	C	E	B	E	E	E	E	E	E	E	C	E	A	E
United States	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Vanuatu																				
Viet Nam	B	B	B	A	B	B	B	C	A	B	C	C	D	C	C	B	B	C	B	B

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

Updated: 30 January 2014

ID NO.	DATE	STATES	REMARKS
1	14 April 1972	ASEAN States - Indonesia, Malaysia, Philippines, Singapore and Thailand	Multilateral agreement
2	March 1997	ASEAN - Viet Nam	Viet Nam accession to 1972 ASEAN Agreement (as above)
13	November 1990	Australia / Indonesia	Updated 5 April 2004
30	April 2006	Australia / Maldives	Letter of Arrangement
28	2 April 2009	Australia / New Zealand	Notified 2013
20	February 2001	Australia / Papua New Guinea	
	29 July 1999	Australia / New Caledonia	Maritime Arrangement for SAR Cooperation
	8 October 1998	Australia / Solomon Islands	SAR Arrangement
17	16 December 1998	Brunei Darussalam / Malaysia	
		Bhutan / India	
19	February 1999	Cambodia / Viet Nam	
33, 41	1 June 2009	Chile / New Zealand	SAR services coordination
37	16 May 2007	China / Republic of Korea	
26	notified 2003	China / United States	
	Signed 25 Oct 2013	China/Mongolia	
32	6 March 2012	Cook Islands / New Zealand	Notified 2012
35	notified July 2007	French Polynesia (Tahiti) / New Zealand	Final draft agreement being considered by FP authorities
35 bis	notified January 2013	French Polynesia (Tahiti) / United States	Draft agreement being considered by FP authorities
3	June 1982	Indonesia / Singapore	
12	1990	Indonesia / Papua New Guinea	JBC MOU signed
9	9 August 1986	Indonesia / Philippines	
11, 31	1988, July 2006	Indonesia / United States	SAR Services Agreement
42	17 March 2010	Japan/Philippines	SAR Agreement
38	30 April 2008	Japan / Republic of Korea	
10	1986	Japan / United States	
18	1998	Lao PDR / Vietnam	LOA for provision of assistance
5	29 August 1985	Malaysia / Indonesia	
8	9 December 1985	Malaysia / Philippines	
4	11 August 1984	Malaysia / Singapore	
7	9 September 1985	Malaysia / Thailand	
24	notified 2003	Marshall Islands / United States	
25	notified 2003	Micronesia / United States	
	11 April 2008	Mongolia/Russian Federation	
21	22 May 2002	New Caledonia / New Zealand	
34	notified July 2007	New Zealand/Niue	Government aid agreement
29	20 August 2003	New Zealand / Samoa	Notified 2005
36	Notified July 2007	New Zealand/Tokelau	Government aid agreement
27	17 June 2005	New Zealand / Tonga	
23	16 April 2003	New Zealand / United States	

ID NO.	DATE	STATES	REMARKS
22	26 November 2002	Palau / United States	
14	July 1996	Philippines / Singapore	
16	September 1996	Philippines / Viet Nam	
6	September 1985	Singapore / Thailand	Updated July 1996
15	July 1996	Singapore / Viet Nam	
39	March 2009	Viet Nam / Lao PDR	
40	March 2009	Viet Nam / Cambodia	

INTERNATIONAL CIVIL AVIATION ORGANIZATION

D R A F T



ASIA/PACIFIC SAR PLAN

DRAFT Version 0.4b, June 2014

This Plan was developed by the Asia/Pacific Search and Rescue Task Force
(APSAR/TF)

Approved by APANPIRG/XX and published by the
ICAO Asia and Pacific Office, Bangkok

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SCOPE OF THE PLAN

Plan Structure

1.1 The Asia/Pacific Search and Rescue (SAR) Plan (hereinafter referred to as the 'Plan') references different levels. At the higher level are global requirements established by the ICAO Annex 12 to the ICAO Convention on International Civil Aviation (ICAO Doc 7300). Global guidance material is provided by the International Maritime Organization (IMO) and ICAO's joint publication, the International Maritime and Aeronautical SAR manual (IAMSAR). Beneath this is regional planning primarily provided by this Plan and other regional guidance material, in order to define the goals and means of meeting objectives for State planning, such as Regional Air Navigation Plan (RANP, ICAO Doc 9673) objectives.

1.2 The global air navigation perspective is guided mainly by the *Global Air Navigation Plan* (GANP, Doc 9750), the *Global ATM Operational Concept* (Doc 9854) and the *Global Aviation Safety Plan* (GASP).

1.3 The scope of the Plan is the identification of:

- the current status of SAR preparedness of Asia and Pacific Region States and State SAR arrangements;
- relevant SAR contingency procedures from other ICAO regions, particularly those from States with Flight Information Regions (FIRs) or Search and Rescue Regions (SRRs) that adjoin Asia/Pacific FIRs/SRRs; and
- recommendations for SAR planning and preparedness enhancements, in terms of compliance with Annex 12, IAMSAR Manual guidance, and accepted best international practice.

1.4 References in the Plan to 'States' are intended to include Special Administrative Regions and territories.

Plan Review

1.5 As an iterative process, the Plan requires regular updating to keep current with changes in technology, political considerations and human performance. It is intended that APANPIRG and its contributory bodies conduct a complete review every three years (or a shorter period determined by APANPIRG) of the Plan to align with the review cycle of the GANP.

OBJECTIVES

Introduction

2.1 The last decade has seen a steady increase in air traffic in the Asia/Pacific region and this is forecast to grow significantly (the Asia/Pacific region is already the world's largest air transport market with a 30 percent share in terms of Revenue Passenger Kilometres). In addition, maritime traffic is also increasing, adding further urgency to ensuring that States with oceanic SAR responsibilities in the region meet the requirements of both ICAO and IMO for the provision of aviation and maritime SAR services.

2.2 The world's citizens, who frequently fly over or sail through such remote areas, expect a timely and adequate SAR response to be provided should it be required. Asia/Pacific States who are signatories to the Chicago Convention accept the responsibility for the provision of SAR services per the requirements of Annex 12 to the ICAO Convention on International Civil Aviation and are responsible for the provision of SAR services over vast oceanic areas. However, the ICAO Asia/Pacific SAR Capability Matrix Table illustrates there are SAR capability gaps in the region with either the non-implementation or partial implementation of Annex 12 requirements. A number of States have not reported their SAR capability status at all.

2.3 States in the region need to be adequately prepared for the provision of efficient and effective SAR services. To assist in achieving this, it is essential for States to cooperate, collaborate and in some cases assist with resources to neighbouring and regional RCCs.

2.4 Recognising the deficiencies in capabilities of some States in the Asia/Pacific region to meet their responsibility of compliance under Annex 12, APANPIRG 2012 meeting established an Asia/Pacific Task Force (APSAR T/F) to produce an Asia/Pacific Search and Rescue Plan (APSAR Plan) to address those deficiencies.

2.5 This Plan is designed to address both military and civil SAR authorities and has been developed in consultation of Asia/Pacific States, SAR administrations and relevant International Organisations. States should consult with stakeholders nationally, regionally and internationally as appropriate and determine actions in order to commit to achieving the objectives of this SAR Plan in order to meet the minimum SAR service requirements of ICAO Annex 12. Where States are unable to meet the minimum SAR service requirements of ICAO Annex 12, this should be notified to ICAO as differences to the Annex 12 Standards and Recommended Practices (SARPs).

2.6 States do not need to meet their obligations all at once and it may be more productive to make gains in small steps commencing with actions that have a minimal cost (e.g. the establishment of a national SAR Committee and ensuring SAR Agreement are in place with neighbouring States), allowing for seamless cross-border transit of search assets engaged in SAR activity.

2.7 All States are encouraged to adopt this plan as a way forward, thus ensuring a timely, well-coordinated response to any SAR incident within their area of responsibility.

Plan Objective

2.8 The objective of the SAR Plan is to provide a framework to assist Asia/Pacific States in meeting their SAR needs and obligations accepted under the Convention on Civil Aviation and for the harmonised and interoperable delivery of both aeronautical and maritime SAR services within the Region, and across other ICAO Regional boundaries, when practicable.

2.9 The Plan is to be consistent with the SARPs of ICAO Annex 12 Search and Rescue, and aligned where appropriate with the SAR technical and operational measures and recommendations of the IMO.

2.10 The Plan recognizes that ICAO serves as the forum for the implementation of practical and achievable measures to improve SAR services for the civil air transportation system. The Plan also recognizes that the IMO provides a similar forum for SAR services to the maritime transportation system.

2.11 Both ICAO and IMO share the same goal of ensuring that SAR services are available globally wherever people sail or fly. The SAR services that ICAO and IMO promote are complimentary and offer tangible opportunities to derive mutually beneficial efficiencies for both the aviation and maritime transportation SAR systems globally, regionally and nationally. The objective of this Plan includes encouraging States to take advantage of such efficiencies

2.12 SAR plans describe how SAR services will be provided, organized and supported. SCs oversee and implement these documents. SAR plans should be signed by all Government agencies which can provide or support SAR services. These agencies should all be represented on the SCC which oversees these plans. **Expand SC and SCC**

Plan Development

2.13 The Regional Search and Rescue Plan was developed by the ICAO Asia/Pacific SAR Task Force consistent with the APANPIRG Terms of Reference which are:

- a) to ensure continuous and coherent development of the Asia/Pacific Regional Air Navigation Plan and other relevant regional documentation in a manner that is harmonized with adjacent regions, consistent with ICAO SARPs and Global Air Navigation Plan for CNS/ATM Systems (Doc 9750) and reflecting global requirements;
- b) to facilitate the implementation of air navigation systems and services as identified in the Asia/Pacific Regional Air Navigation Plan with due observance to the primacy of air safety, regularity and efficiency; and
- c) to identify and address specific deficiencies in the air navigation field.

2.14 The Regional Search and Rescue Plan was developed as part of a suite of Asia/Pacific air navigation plans, including the Regional ATM Contingency Plan, and the Seamless ATM Plan, so the Plan should not be considered in isolation.

2.15 The Plan is expected to provide guidelines and recommendations for Asia/Pacific States to consider for the enhancement and improvement of national, sub-regional and regional SAR capability including:

- Compliance with Annex 12 SARPs;
- Identification and addressing of deficiencies in SAR capability;
- Continuous and coherent development of SAR capability;
- Harmonisation of aeronautical and maritime SAR services;
- Remote oceanic SAR response capability;
- Establishment and review of arrangements between neighbouring States to expeditiously facilitate SAR coordination, operations and cooperation across regional boundaries including contingency procedures;
- Facilitation of the implementation of SAR systems and services including the establishment of JRCCs where suitable and practicable;
- Supporting the sharing of SAR information, data and expertise;

- Monitoring of outcomes from APANPIRG Sub-Groups, other ICAO Region SAR groups, ICAO/IMO SAR Joint Working Group and related forums for issues that may affect the APAC Region;
- Facilitation of a continuous reporting mechanism of State SAR capability, Annex 12 compliance and SAR performance data to the APAC Regional Office and the APANPIRG ATM/SG
- Implementation of a Quality Assurance program for SAR
- Coordinating the introduction of new technology affecting the regional SAR system,
- Sharing future research and development concepts
- Seeking efficiencies, through the coordination and facilitation of concurrent regional SAR meetings, seminars, workshops and exercises, including joint ICAO and IMO, and sub-regional forums where practicable; and
- Conducting efficient SAREX that identify improvements and latent problems.

2.16 The elements should be periodically reviewed by APANPIRG to ensure they remain relevant to the SAR system, particularly for new technology developments.

2.17 The Plan should be available in either hard copy or online formats as appropriate, to each RCC and SAR Authority. This publication may then supersede the requirement for SAR facilities information contained within Table SAR 1 in the Facilities and Services Implementation Document (FASID, Volume II of the Asia and Pacific Region Air Navigation Plan (Basic Air Navigation Plan, Doc 9673), subject to the endorsement of Asia/Pacific States.

EXECUTIVE SUMMARY

3.1 ICAO reported in December 2012 that 2.9 billion people used scheduled air transport services in 2012, with the annualized passenger figure up 5 per cent since 2011, and is expected to reach over 6 billion by 2030 according to current projections. The number of flights should also double, from 30 million to 60 million a year.

3.2 The Asia/Pacific region was the world's largest air transport market in 2012 with a 30 per cent share in terms of world Revenue Passenger Kilometres (RPKs).

3.3 Maritime traffic in the Asia/Pacific region is also increasing and whilst IMO sponsors the provision of maritime SAR services, the demand for aeronautical SAR services which frequently support responses to maritime SAR incidents is also likely to rise.

3.4 Asia/Pacific States who are signatories to the Chicago Convention accept the responsibility for the provision of SAR services per the requirements of Annex 12 Search and Rescue. Increases in both aviation and maritime traffic throughout the Asia/Pacific region places additional importance on the ability for States to be adequately prepared for potentially increased demand for aeronautical and maritime SAR services.

3.5 Considering that many of the Asia/Pacific States have the challenging responsibility for providing a SAR service over vast and remote oceanic areas, including three of the world's five oceans, the importance for States with oceanic SAR responsibility to cooperate, collaborate and share resources with their neighbouring and regional RCCs is essential.

3.6 In 2012 APANPIRG established the Asia/Pacific SAR Task Force (APSARTF) to assist with increasing discussion on SAR matters within APANPIRG and to develop a plan to address deficiencies in regional SAR capability. This Asia/Pacific SAR Plan was developed in accordance with Terms of Reference approved by APANPIRG.

3.7 High-level support might be necessary from regional bodies that can effectively support the Plan's implementation, such as the:

- Association of Southeast Asian Nations (ASEAN);
- Asia Pacific Economic Cooperation (APEC);
- South Asian Association for Regional Cooperation (SAARC); and
- Secretariat of the Pacific Community (SPC).

3.8 x.

Stakeholder Summary

3.9 This Plan addresses the full range of SAR stakeholders, including civil and military SAR authorities. The Plan has been developed in consultation with Asia/Pacific States, SAR administrations and relevant International Organizations (IO).

3.10 States should consult with stakeholders nationally, regionally and internationally as appropriate and determine actions in order to commit to achieving the objectives of this SAR Plan in order to meet the minimum SAR service requirements of ICAO Annex 12. Where States are unable to meet the minimum SAR service requirements of ICAO Annex 12, these should be notified to ICAO as differences to the Annex 12 SARPs.

3.11 x

ABBREVIATIONS AND ACRONYMS

APANPIRG	
ARCC	Aeronautical Rescue Coordination Centre
ATM	Air Traffic Management
JRCC	Joint Rescue Coordination Centre
MRCC	Maritime Rescue Coordination Centre
RCC	Rescue Coordination Centre
SAR	Search and Rescue
SARPs	Standards and Recommended Practices
SRR	Search and Rescue Region

4.1 XXX

TO BE COMPLETED ON FINAL EDIT

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BACKGROUND INFORMATION

APSAR/TF

5.1 APANPIRG/23 (Bangkok, Thailand, 10-14 September 2012) agreed to the following Decision:

Decision ATM/AIS/SAR/SG/22-12 – Establishment of APSAR Task Force

That, an Asia/Pacific Regional SAR Task Force (APSAR/TF) be established, reporting to the ATM Sub-Group of APANPIRG, in accordance with the Terms of Reference as shown in Appendix I to the Report on Agenda Item 3.2

5.2 The First Meeting of the Asia/Pacific Regional Search and Rescue Task Force (APSAR/TF/1) was held in Bangkok from 5 to 7 February 2013.

Improvement Drivers

5.3 The next generation of 406MHz distress beacons represented a dramatic step forward, with accuracies of 100m or less, and constant alerting, so it was important to start planning for this implementation starting in 2015.

5.4 The need to ensure States register 406 MHz distress beacons, and, that the register is available to both aeronautical and maritime RCCs can be associated with Annex 12 – *Search and Rescue*. However, it is Annex 10 which provides the requirement. States should note that Annex 12 should be read in conjunction with the following ICAO Annexes:

Annex 6 – Operation of Aircraft: Part I International Transport (cargo and passenger aircraft), Chapter 6 in general and ELT in particular; Part II International General Aviation, Chapter 6 in general and ELT in particular; and Part III Helicopters, Chapter 4;

Annex 10 – Aeronautical Telecommunications (discussed above); and

Annex 14 – Aerodromes: Chapter 9 regarding aerodrome emergency planning; exercises; and, establishment, testing and assessment at regular intervals of a predetermined response for the specialist rescue services.

5.5

[Include material from the SG Meeting 2012, APSARTF1, HLSC, others?]

CURRENT SITUATION

Asia/Pacific SAR Capability Analysis

6.1 The following **Figure X** depicts Asia/Pacific and adjoining FIRs and SRRs.

Figure X: Asia/Pacific and adjoin FIRs/SRRs

6.2 In this Section there should be a statement of SAR capability and barriers, issues, etc. This can largely come from the SAR/TF/3 report. However all known issues should be detailed here if already clear.

Asia/Pacific SAR Coordination Forums

6.3 The Asia/Pacific Region will benefit from the cooperation and coordination of States and International Organizations involved in the APSAR/TF. After the APSAR/TF completes its tasks, the establishment of permanent joint ICAO/IMO Regional SAR Forums to enable collaboration and cooperation on oceanic SAR matters across the specific oceanic regions and including adjacent ICAO regions is considered imperative, such as:

- a) Pacific Ocean SAR Forum – including Pacific States of the Asia/Pacific, North American and South American regions; and
- b) Indian Ocean SAR Forum – including Indian Ocean States of the Asia/Pacific, East African and Middle East regions.

Barriers

6.4 The following potential issues should be considered to ensure they do not become barriers to the achievement of the expected SAR capability:

- c) establishment of an appropriate legal framework designating, recognizing and giving authority to national SAR authorities;
- d) funding and equipping SAR authorities and in particular, resourcing the RCC;
- e) setting of appropriate SAR organizational framework;
- f) establishment of a National SAR Committee;
- g) clarity of responsibilities for each component of the SAR system, and empowerment of the RCC;
- h) establishment of SAR Agreements; and
- i) lack of recognition of the importance of SAR.

6.5 The provision of sufficient resources was critical in a number of areas, including:

- a) financial-
 - i. funding for 24 hour RCC facility and staff;
 - ii. funding for use/hire of search and rescue units; and
 - iii. Provision of a suitable administrative process enabling financial support including the ability for SAR authorities to quickly authorise payments required for emergency response aircraft, vessels and supporting logistics such as fuel.
- b) RCC personnel- a suitable number of trained and skilled staff;
- c) RCC facilities-
 - i. appropriate RCC facility space (Australia to add recommended metre space and RCC minimum equipment list – this could be an Appendix);
 - ii. minimum RCC tools (such as current charts, plotting equipment, documentation, etc.);
 - iii. reliable and rapid H24 communications, and a suitable means to-
 - 1. receive and communicate distress alerts
 - 2. communicate with ATS units, other RCCs/RSCs, Coast Radio Stations, COSPAS-SARSAT Mission Control Centres (MCCs), military units, medical services, meteorological offices, etc.; and
 - 3. identify and task available SRUs.
 - iv. information technology-
 - 1. RCC workstation computers;
 - 2. Software including basic databases, drift modelling, incident management, etc.; and
 - 3. Aircraft and vessel tracking information including ADS-B, AIS, etc.
- d) Search and Rescue Units (SRUs)-
 - i. available and suitable SAR aircraft and crews;

- ii. funding arrangements/agreements for hiring/payment/sharing of SRUs to permit rapid deployment; and
 - iii. Available and suitable SAR survival equipment for delivery by aircraft to survivors and to assist SAR coordination efforts (eg SAR Datum Buoys);
- e) Training support-
 - i. RCC staff – basic and ongoing; and
 - ii. SRU crews – pilots, air crew and air observers.

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PERFORMANCE IMPROVEMENT PLAN**Preferred SAR Capability Specifications (PSCS)*****PSCS Phase I (expected implementation by 12 November 2015)***Organisation

7.1 States should develop statutes and related provisions that establish or enhance the legal foundation for a State SAR organization and its framework, resources, policies and procedures to:

- a) ensure that it is party to the following Conventions, as applicable –
 - i.....C
Convention on International Civil Aviation 1944;
 - ii.....I
International Convention on Maritime Search and Rescue, 1979;
 - iii.....I
International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended;
 - iv.....C
Convention on the High Seas, 1958; and
 - v.....U
United Nations Convention on the Law of the Sea (UNCLOS), 1982;
- b) unless delegated by written agreement, establish an entity that provides, on a 24-hour basis, SAR services within its territories and designated area of responsibility;
- c) establish a National SAR Committee consisting of civil and where applicable, military members;
- d) establish a single State SAR point of contact for non-urgent, administrative matters, such details to be submitted to the ICAO Regional Office;
- e) conduct studies to integrate aviation and maritime SAR activities, and as far as practicable, civil and military activities, including joint training of staff and review of documentation to ensure harmonisation of procedures, and joint exercises;
- f) conduct studies to align, as far as practicable, aeronautical and maritime Search and Rescue Regions (SRRs); and SRRs and Flight Information Regions (FIRs); and
- g) establish a single State SAR Plan that –
 - i.....d
describes the relevant SRRs, including the limits for any SRSs;
 - ii.....d
etails the National SAR Committee;
 - iii.....d
etails the governmental and non-governmental agencies with authority and responsibility for SAR coordination within its territories and designated area of responsibility;
 - iv.....d
etails required and available SAR facilities, personnel, and equipment;
 - v.....d
etails the SAR manuals, plans and procedures for national and regional

- cooperative SAR response arrangements;
- vi.d
etails the SAR personnel training and competency programme, qualification standards, SAR certification if applicable and SAR cooperation training;
 - vii.d
etails a single SAR point of contact for non-urgent, administrative matters;
 - viii.d
etails the SAR agreements required;
 - ix.i
s electronic and accessible on the Internet, such details to be submitted to the ICAO Asia/Pacific Regional Office; and
 - x.i
s controlled by quality assurance processes.

Procedures and Training

7.2 States should:

- a) ensure robust SAR Alerting procedures are in place, tested and fully integrated with RCC procedures so that RCCs are rapidly notified of any SAR event 24 hours a day;
- b) establish aerodrome emergency plans to provide for co-operation and co-ordination with RCCs;
- c) establish SAR Agreements with States having adjoining SRRS or FIRs, including trans-regional neighbours;
- d) provide cross-border information on SAR capability. (This should be included in bilateral SAR agreements per Annex 12.);
- e) pre-arrange procedures for cross-border SAR responses. (This should be included in bilateral SAR agreements per Annex 12.);
- f) establish contingency procedures for delegation of SAR responsibility where such service is not able to be provided, or in contingency (temporary) circumstances;
- g) establish a program for an annual SAREX in each sub-region (South Asia, Southeast Asia, East Asia and the Pacific). Every second year should be a desktop communications exercise, alternate years being a full exercise;
- h) develop regional SAR training modules for RCC SAR Mission Coordinators (SMCs) and SAR Coordinators with the JWG;
 - develop individual competency assessments for SMC during operational duty and SAREX; and
 - study the feasibility of establishing a joint ICAO/IMO Regional SAR Training Team to assist States unable to provide their own SAR training. *(Comment: there is a large demand for this regionally however States have difficulty providing it to their own RCCs – funding and availability of SAR training expertise in country seem to be the main issues. Needs ICAO/IMO support.)*

7.3 State SAR coordination plans should include procedures for joint aeronautical and maritime distress alert notification, support and response to both aircraft and shipping SAR incidents, including protocols for civil and military support and sharing of resources.

7.4 States should establish procedures enabling:

- a) availability and deployment of suitably crewed and equipped SRUs, public and/or private, civil and military, for rapid SAR response;
- b) availability and deployment of SRU craft that may be in use for another primary purpose but made available to RCCs for SAR purposes on an as needed emergency basis;
- c) protocols to request assistance of military assets and similarly military SAR authorities allowed to request civil assets;
- d) cooperative use and/or sharing of SAR assets with protocols incorporated within National SAR Plans and bilateral SAR Agreements; and
- e) pre-arranged funding of costs associated with hiring of SRUs to avoid any delays in response availability.

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7.5 States should establish RCC plans for response to Mass Rescue Operations (MROs) integrated with national disaster plans.

Facilities

7.6 States should establish RCCs of sufficient size and facilities commensurate with the guidance in **Appendix XX**.

7.7 States should evaluate the possibility and feasibility of establishing Joint RCCs (JRCCs) to incorporate the aeronautical and maritime SAR activities and/or facilities of ARCCs and MRCCs. Where not practicable, development of facilities and procedures which provide and/or enhance effective SAR coordination and collaboration between the ARCCs and MRCCs in support of each other.

7.8 Where practicable, the evaluation may consider consolidation of two or more different State RCCs into single sub-regional JRCCs.

7.9 For RCCs with responsibility for oceanic areas, States should establish additional oceanic SAR capability to ensure a timely and adequate SAR response is available to all oceanic areas of their SRRs.

7.10 States should provide tools that assist RCCs to provide an improved service such as:

- a) joint aeronautical and maritime electronic mapping;
- b) maritime broadcast facilities;
- c) shipping/vessel communications – Coast Radio Stations, RCC radio and satellite communications, marine radio networks;
- d) aircraft communications – via ATS units, aircraft operators, satellite communications;
- e) access to live aircraft and ship tracking data, e.g. ADS-B (aviation), AIS (maritime) allowing rapid identification of potential aircraft and vessels that may divert to assist;
- f) drift modelling software;
- g) ocean data including sea temperature, currents, winds, tides, etc;
- h) SAR Datum Buoys, preferably with satellite tracking capability; and
- i) RCC recording and plotting of search object sightings and debris.

7.11 States should ensure that SRU aircraft have:

- a) marine VHF radio to enable communication with vessels if used over marine areas;
- b) direction-finding capability for locating distress beacons;
- c) the capability of delivering/dropping SAR supplies to survivors and other SAR equipment (e.g. SAR Datum Buoys);
- d) trained air search observers; and
- e) night search capability including night-vision devices where appropriate.

7.12 States should establish a regional publication which depicts both aeronautical and maritime SRRs geographically in chart format. This publication should be available for all aeronautical and maritime RCCs, ATS units, aircraft operators and (others?) in hard copy and/or online format to enable rapid determination of the responsible RCC for any distress alert.

7.13 States should establish a centralised information source publishing all Asia/Pacific State Aeronautical Information Publication (AIP) information as required by ICAO Annex 15 Appendix 1, page APP 1-8 including:

- a) The agency responsible for providing SAR services;
- b) The area of SAR responsibility where SAR services are provided;
- c) The type of SAR services and facilities provided including indications where SAR aerial coverage is dependent upon significant deployment of aircraft;
- d) SAR agreements;
- e) The conditions of SAR facility and service availability; and
- f) SAR procedures and signals used.

7.14 States should establish a web-based SAR Library, or cooperate by contributing to an Internet-based Asia/Pacific resource.

7.15 States should develop and maintain a current, comprehensive electronic list of State SAR Facilities, SAR Equipment, and SAR Units (SRUs), including joint or shared facilities and equipment, and provide the Internet link to that list to the ICAO Asia/Pacific Regional Office.

SAREX

7.16 States should conduct regular SAREXs (at least once every two years) to test and evaluate:

- a) oceanic SAR response procedures including both aeronautical and maritime SAR authorities, civil and military;
- b) where appropriate, cross-SRR boundary coordination (SAREX should routinely involve SAR authorities of adjacent SRRs, especially if the area concerned is within 50NM of the SRR boundary);
- c) SAREX effectiveness through a post-SAREX review and written report, completed to ensure that deficient areas or latent problems were identified and remedied. Note: a SAREX template is provided at [Appendix X](#).

COSPAS-SARSAT Distress Beacon System

7.17 States should :

- a) have a reliable distress beacon registration system in place which includes up to date registration details for all national civil and military ELTs, EPIRBs and PLBs;
- b) Maintain a distress beacon register with details available and accessible to RCCs 24 hours a day;
- c) establish a plan for the introduction of new generation 406MHz distress beacons Receiver capability; and
- d) where separate ARCCs and MRCCs exist with responsibility for coincident aviation and maritime SRRs, States should coordinate distress beacon alert procedures to ensure both RCCs are aware of any distress beacon activations within their areas to avoid duplication of response. MRCCs should ensure the procedures alert ARCCs and ATS units to any EPIRB activations.

System Improvement

- 7.18 States should establish quality assurance procedures that –
- a) provides performance and safety indicators, including post-incident/accident lessons learned and management reviews (RCC and SAR System Continuous Improvement process), and feedback from RCC staff, SAR system users or SAR stakeholders;
 - b) identifies corrective and preventive actions that prevent or minimise the possibility of substandard SAR performance;
 - c) establishes an internal quality assurance programme, which includes regular internal audits of the SAR facilities and procedures that are conducted by trained auditors;
 - d) ensures the person responsible for internal quality assurance within the entity responsible for SAR services has direct access to report to the Chief Executive of the entity responsible for SAR services on matters of quality assurance.
- 7.19 States should conduct an annual or more frequent analysis of their current State SAR system to identify specific gaps in capability against the minimum requirements of Annex 12 and the guidelines of the IAMSAR Manual to:
- a) enable the ICAO Asia/Pacific SAR Capability Matrix to be updated to accurately reflect the State's capability;
 - b) analyse the level of consistency of SAR services in neighbouring States;
 - c) identify SAR research and development programmes, conducted if possible in cooperation with other States;
 - d) establish a common set of basic SAR system statistics, which include-
 - i. number of SAR incidents per year;
 - ii. number of lives at risk versus number of lives saved;
 - iii. time from first alert to arrival on scene of first SRU; and
 - iv. time from first alert to rescue;
 - e) plan for any necessary improvements and compliance to gradually build and improve capability over time, which would be detailed in the State SAR Plan; and
 - f) update SAR agreements as appropriate.
- 7.20 States should conduct SAR promotion programs to:
- a) assist media understand SAR operations to minimise the need to explain during SAR responses;
 - b) ensure support of SAR facilities and improvements by decision-makers;
 - c) encourage higher SAR preparedness by persons that may require SAR services;
 - d) enhance cooperation between SAR services and –
 - i. military and police agencies;
 - ii. air traffic control facilities;
 - iii. aerodrome and port operators;
 - iv. aircraft and shipping operators;
 - v. meteorological agencies;

- vi. government and non-government agencies affected by SAR operations; and
 - vii. other States.
- e) recognise improvement in State SAR systems.

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PSCS Phase II (expected implementation by 09 November 2018)

Procedures and Training

7.22 States should ensure there are established contingency procedures in place for delegation of SAR responsibility where such service is not able to be provided, or in contingency (temporary) circumstances.

7.23 **THE INTENTION IS TO MOVE ANY LONGER TERM PSCS ELEMENTS CURRENTLY SHOWING IN PHASE I TO PHASE II**

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RESEARCH AND FUTURE DEVELOPMENT

Research and Development

8.1 To develop the tools and systems required to meet foreseeable long-term requirements, there is a need for States to undertake and co-operate on SAR. This includes major efforts to define concepts, to extend knowledge and invent new solutions to future SAR challenges so these new concepts are selected and applied in an appropriate timely manner. Such efforts could be forged through collaborative partnerships between, States, ANSPs, International Organizations, institutes of higher learning and specialised technical agencies. This concept is consistent with Seamless ATM Principle 36 (*Inter-regional cooperation ('clustering') for the research, development and implementation of ATM projects*).

8.2 With the end goal of a globally interoperable SAR system in mind, the region will have to consider planning for a long term supporting concept and infrastructure. The following are possible areas that should be considered for future SAR research and development, in order to promote the maximum possible harmonisation and interoperability of SAR systems:

- a) real time automated data link communication to RCCs when an aircraft or ship exceeds a Variable Set Parameter (VSP) in terms of its operating envelope, or activation of an emergency status (could be displayed as a symbol, and the data could include certain operating parameters such as acceleration and altitude for an aircraft);
- b) regional Unmanned Aerial Systems (UAS) SAR capability;
- c) location accuracy requirement for accident site for certain categories of aircraft;
- d) ELT activation while in-flight by the new generation of satellites and ground stations in the Cospas-Sarsat System;
- e) new generation beacon which uses 406MHZ for homing capability; and
- f) enhanced technology oriented systems to improve SAR system effectiveness.

MILESTONES, TIMELINES, PRIORITIES AND ACTIONS

Milestones

9.1 Section 7 (Performance Improvement Plan) provides milestones and timelines for a number of elements in the PSCS Phase I and II, being effective **12 November 2015** and **09 November 2018** respectively.

9.2 It should be noted that States should commence planning for the various PSCS elements. This should be planned from the approval of this Plan, to ensure a smooth transition by the onset of Phase I, and should include consideration of issues such as:

- safety/operational analysis and assessment;
- cost-effectiveness;
- budgetary issues;
- development of operational procedures; and
- training.

9.3 Section 8 (Research and Future Development) provides, subject to future agreement by concerned parties, possible SAR improvements beyond **2018 until 2028**.

Priorities

9.4 It is a matter for each State to determine priorities in accordance with its own economic, environmental, safety and administrative drivers.

Actions

9.5 This Plan necessitated a number of implementation actions. It is expected that each Asia/Pacific State report progress on each applicable element to APANPIRG.

9.6 Section 6 (Current Situation) provides detailed analysis and major concerns in the region, which should be considered in the formulation of specific State plans.

SAREX

9.7 A program is expected to be established for an annual SAREX in each sub-region (South Asia, Southeast Asia, East Asia and the Pacific), with every second year being a desktop communications exercise, and alternate years being a full exercise. The Exercise outcomes and lessons learned should be reported to APANPIRG through the ATS Sub-Group.

9.8 The ICAO Asia and Pacific Regional Office is responsible for taking actions that assist the implementation of SAR within its accredited States, in coordination with the IMO. In addition, the Asia and Pacific Regional Office coordinated with adjacent ICAO regional offices on an ad hoc basis or at relevant trans-regional meetings.

APPENDICES

LIST OF IMO DOCUMENTS AND PUBLICATIONS WHICH SHOULD BE HELD BY A MARITIME RESCUE COORDINATION CENTRE

REFERENCE	DATE	TITLE
1 Publications		
All following publications are available (to be purchased) on: http://www.imo.org/Publications/Documents/Attachments/Welcome.pdf		
IE-110 A/C/E/F/R/S	2009	International Convention for the Safety of Life at Sea (SOLAS) (Consolidated Edition, 2009)
I-175 A/C/E/F/R/S	2009	SOLAS Amendments 2008 and 2009
I-176 A/C/E/F/S	2011	SOLAS Amendments 2010 and 2011 (2011 edition)
IB-955 A/C/E/F/R/S	2006	SAR Convention (2006 edition)
IH-960 E/F/S	2013	International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volume I (2010 edition) – Organization and Management
IE-961 E/F/S	2013	International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volume II (2010 edition) – Mission Coordination
IH-962 E/F/S	2013	International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volume III (2010 edition) – Mobile Facilities
IE-970 E	2011	GMDSS Manual (2011 edition)
I-969 E	1992	GMDSS Operating Guidance Card (1992 edition)
IA-987 E/F/S	2005	IMO Standard Marine Communication Phrases (SMCP) – (including CD-ROM: pronunciation guide) (2005 edition)
IB 908 E/F/S	2011	*International SafetyNET Manual (2011 edition)
ID 951 E/F/S	2012	**NAVTEX Manual (2012 edition)
I-910 M	2010	Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI) (2010 edition)
IA-994 E/F/S	2005	International Code of

II-200 E/F/S	2012	Signals (2005 edition) International Maritime Dangerous Goods Code (IMDG Code) (2012 edition) (incorporating amendment 36-10)
IH-210 E/F/S	2010	IMDG Code Supplement (2010 edition)

2 Unpublished documents

Following Assembly resolutions and MSC Circulars are available for free at:

<http://www.imo.org/KnowledgeCentre/IndexofIMOResolutions/Pages/Default.aspx>

COMSAR Circulars are available for free at (IMODOCS):

<http://docs.imo.org/Category.aspx?cid=376>

Res. A.705(17), as amended (MSC.1/Circ.1287.Rev.1)	06/11/91	Promulgation of Maritime Safety Information (MSI)
Res. A.706(17), as amended (MSC.1/Circ.1288.Rev.1)	06/11/91	World-Wide Navigational Warning Service
Res. A.814(19)	23/11/95	Guidelines for the Avoidance of False Distress Alerts
Res. A.855(20)	27/11/97	Standards for onboard helicopter facilities
Res. A.856(20)	27/11/97	Guidance to Administrations on development of a shore- based SAR telecommunication infrastructure
Res. A.887(21)	25/11/99	Establishment, updating and retrieval of the information contained in the registration databases for the Global Maritime Distress and Safety System (GMDSS)
Res. A.894(21)	25/11/99	International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual
Res. A.919(22)	29/11/01	Acceptance and implementation of the International Convention on Maritime Search and Rescue, 1979, as amended
Res. A.920(22)	29/11/01	Review of safety measures and procedures for the treatment of persons rescued at sea
Res. A.949(23)	05/12/03	Guidelines on places of refuge for ships in need of assistance
Res. A.950(23)	05/12/03	Maritime Assistance Services (MAS)
Res. A.954(23)	05/12/03	Proper use of VHF channels at sea
Res. A.999(25)	29/11/07	Guidelines on voyage

Res. A.1001(25)	29/11/07	planning for passenger ships operating in remote areas Criteria for the provision of mobile-satellite communication systems in the Global Maritime Distress and Safety System (GMDSS)
Res. A.1044(27)	30/11/11	Piracy and armed robbery against ships in waters off the coast of Somalia
Res. A.1051(27)	20/12/11	IMO/WMO Worldwide Met-Ocean Information and warning Service – Guidance Document
Res. MSC.131(75)	21/05/02	Maintenance of a continuous listening watch on VHF channel 16 by SOLAS ships whilst at sea after 1 February 1999 and installation of VHF DSC facilities on non-SOLAS ships
Res. MSC.167(78)	20/05/04	Guidelines on the treatment of persons rescued at sea
Res. MSC.199(80)	16/05/05	Adoption of amendments to provision of radio services for the Global Maritime Distress and Safety system (GMDSS) – (resolution A.801(19))
Res. MSC.239(83)	12/10/07	Adoption of amendments to the International Convention for the Safety of Life at Sea, 1974, as amended (relating to GMDSS satellite providers)
Res. MSC.305(87)	17/05/10	Guidelines on Operational Procedures for the promulgation of Maritime Safety Information concerning acts of Piracy and Piracy counter-measure operations
COMSAR/Circ.3	19/04/96	Relations between NAVAREA Coordinators and Rescue Coordination Centres
COMSAR/Circ.13	06/03/98	Shore-to-ship communications during a distress
COMSAR/Circ.22	20/06/00	Guidance on data fields for SAR databases
COMSAR/Circ.23	20/06/00	Guidance for central alerting

COMSAR/Circ.25	15/03/01	posts (CAPs) Procedure for responding to DSC distress alerts by ships
COMSAR/Circ.29	27/05/02	Guidance for the voluntary use of the standardized questionnaires and formats for reporting false alerts in collecting data on false alerts
COMSAR/Circ.31	06/02/03	Guidance for Mass Rescue Operations (MROs)
COMSAR/Circ.35	21/05/04	Recommendations on medium frequency/high frequency (MF/HF) digital selective calling (DSC) test calls to coast stations
COMSAR/Circ.37	28/02/05	Guidance on minimum communication needs of Maritime Rescue Coordination Centres (MRCCs)
COMSAR.1/Circ.41	16/10/07	Analysis of Maritime Safety Information Promulgated via the EGC SafetyNET system and recommendations on improving its quality
COMSAR.1/Circ.45	04/02/09	Guidance on distress alerts
COMSAR.1/Circ.53/Rev.1	27/06/11	List of Land Earth Station (LES) Operation Coordinators in the Inmarsat System
COMSAR.1/Circ.50/Rev.3	13/01/12	*Distress priority communications for RCC from shore to ship via Inmarsat
COMSAR.1/Circ.51/Rev.3	18/01/12	List of NAVAREA Coordinators
COMSAR.1/Circ.55	30/11/12	Guidance for entering and updating information on search and rescue services into GISIS and on how to get access to the information for operational use
COMSAR.1/Circ.56	30/11/12	Guidance on smartphone and other computer device SAR applications
MSC/Circ.805	06/06/97	Guidance for the use of radio signals by ships under attack or threat of attack from pirates or armed robbers
MSC/Circ.895	04/02/99	Recommendation on helicopter landing areas on ro-ro passenger ships

MSC/Circ.896/Rev.1	12/06/01	Interim measures for combating unsafe practices associated with the trafficking or transport of migrants by sea
MSC/Circ.960	20/06/00	Medical assistance at sea
MSC/Circ.1042	28/05/02	List of contents of the "Emergency Medical Kit/Bag" and medical consideration for its use on ro-ro passenger ships not normally carrying a medical doctor
MSC/Circ.1043	31/05/02	Guidance on ships' daily reporting of their positions to their companies
MSC/Circ.1073	10/06/03	Measures to enhance maritime security – Directives for maritime rescue coordination centres (MRCCs) on acts of violence against ships
MSC/Circ.1078	06/06/03	Guidelines to Administrations on reporting false alerts
MSC/Circ.1079	10/07/03	Guidelines for preparing plans for cooperation between search and rescue services and passenger ships (in accordance with SOLAS regulation V/7.3)
MSC/Circ.1105	25/02/04	Guidance on responsibility and liability issues related to the use of the emergency medical kit/bag and evaluation of its use in emergency incidents
MSC/Circ.1172	23/05/05	Identification of passenger ships, other than ro-ro passenger ships, which should benefit from being equipped with the Emergency Medical Kit/Bag (EMK)
MSC.1/Circ.1182	31/05/06	Guide to recovery techniques
MSC.1/Circ.1183	31/05/06	Guidelines on the provision of external support as an aid to incident containment for SAR Authorities and others concerned
MSC.1/Circ.1184	31/05/06	Enhanced contingency planning guidance for passenger ships operating in

		areas remote from SAR facilities
MSC.1/Circ.1185/Rev.1	23/05/12	Guide for cold water survival
MSC.1/Circ.1186	01/06/06	Guidelines on the training of SAR service personnel working in major incidents
MSC.1/Circ.1208	22/05/06	Promoting and verifying continued familiarization of GMDSS operators on board ships
MSC.1/Circ.1210	11/07/06	Cospas-Sarsat International 406 MHz Beacon Registration Database
MSC.1/Circ.1218	15/12/06	Guidance on exchange of medical information between telemedical assistance services (TMAS) involved in international SAR operations
MSC.1/Circ.1248	16/10/07	Minimizing delays in search and rescue response to distress alerts
MSC.1/Circ.1287/Rev.1	June 2013	Amendments to resolution A.705(17) – Promulgation of Maritime Safety Information
MSC.1/Circ.1288/Rev.1	June 2013	Amendments to resolution A.706(17) – World-Wide Navigational Warning Service
MSC.1/Circ.1333	26/06/09	Recommendations to Governments for preventing and suppressing piracy and armed robbery against ships
MSC.1/Circ.1334	23/06/09	Guidance to shipowners and ship operators, shipmasters and crews on preventing and suppressing acts of piracy and armed robbery against ships
MSC.1/Circ.1338	01/03/11	Guidance to search and rescue services in relation to requesting and receiving LRIT information
MSC.1/Circ.1364	24/05/10	Revised International SafetyNET Manual
MSC.1/Circ.1365	24/05/10	Commercially available locating, tracking and emergency notification devices
MSC.1/Circ.1367	24/05/10	Amendments to the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual
MSC.1/Circ.1382	03/12/10	Questionnaire on the availability of shore-based

MSC.1/Circ.1403	23/05/11	facilities in the GMDSS Revised NAVTEX Manual Principles and Guidelines relating to the review and audit of the performance of LRIT Data Centres and the International LRIT Data Exchange (Principles and Guidelines)
MSC.1/Circ.1412	28/05/12	
MSC.1/Circ.1413	25/05/12	Basic safety guidance for yacht races or oceanic voyages by non-regulated craft
MSC.1/Circ.1415	25/05/12	Amendments to the IAMSAR Manual
GMDSS.1/Circ.14	18/12/12	Master Plan of shore-based facilities for the GMDSS (GMDSS Master Plan)
SAR.8/Circ.4	01/12/12	Global SAR Plan containing information on the current availability of SAR services
SAR.7/Circ.11	2013	List of IMO documents which should be held by an MRCC
Non-IMO documents		
ITU List IV E/F/S	November 2011	List of Coast Stations and Special Service Stations (List IV) [on CD-ROM] can be purchased at: http://www.itu.int/pub/R-SP-LM/en
ITU List V E/F/S	April 2012	List of Ship Stations and Maritime Mobile Service Identity Assignments (List V) [on CD-ROM] free of charge access using: brtpr@itu.int , http://www.itu.int/ITU-R/go/mars/en
ITU MARS E/F/S	Updated daily	Maritime online access and retrieval system (MARS) containing the same information as in List IV and List V above http://www.itu.int/ITU-R/index.asp?category=terrestrial&rlink=mars&lang=en
Cospas-Sarsat – C/S G.007	October 2012	Handbook on Distress Alert Messages for RCCs, SPOCs and IMO Ship Security Competent Authorities (issue 1/Rev.3) Available for free at: http://www.cospas-

ARNP

sarsat.org/images/stories/SystemDocs/Current/cs_g007_oct_2012.pdf

Air Regional Navigation Plans (ARNP)
<http://www.icao.int/safety/ANP/Pages/Air-Navigation-Plans.aspx>

List of Radio Signals
Non-IMO document

National documents related to national requirement

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

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ASIA/PACIFIC SAR PLAN

DRAFT Version 0.4c, June 2014

This Plan was developed by the Asia/Pacific Search and Rescue Task Force
(APSAR/TF)

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SCOPE OF THE PLAN

Plan Structure

1.1 The Asia/Pacific Search and Rescue (SAR) Plan (hereinafter referred to as the 'Plan') references different levels. At the higher level are global requirements established by the ICAO Annex 12 to the ICAO Convention on International Civil Aviation (ICAO Doc 7300). Global guidance material is provided by the International Maritime Organization (IMO) and ICAO's joint publication, the International Maritime and Aeronautical SAR manual (IAMSAR). Beneath this is regional planning primarily provided by this Plan and other regional guidance material, in order to define the goals and means of meeting objectives for State planning, such as Regional Air Navigation Plan (RANP, ICAO Doc 9673) objectives.

1.2 The global air navigation perspective is guided mainly by the *Global Air Navigation Plan* (GANP, Doc 9750), the *Global ATM Operational Concept* (Doc 9854) and the *Global Aviation Safety Plan* (GASP).

1.3 The scope of the Plan is the identification of:

- the current status of SAR preparedness of Asia and Pacific Region States and State SAR arrangements;
- relevant SAR contingency procedures from other ICAO regions, particularly those from States with Flight Information Regions (FIRs) or Search and Rescue Regions (SRRs) that adjoin Asia/Pacific FIRs/SRRs; and
- recommendations for SAR planning and preparedness enhancements, in terms of compliance with Annex 12, IAMSAR Manual guidance, and accepted best international practice.

1.4 References in the Plan to 'States' are intended to include Special Administrative Regions and territories.

Plan Review

1.5 As an iterative process, the Plan requires regular updating to keep current with changes in technology, political considerations and human performance. It is intended that APANPIRG and its contributory bodies conduct a complete review every three years (or a shorter period determined by APANPIRG) of the Plan to align with the review cycle of the GANP.

OBJECTIVES

Introduction

2.1 The last decade has seen a steady increase in air traffic in the Asia/Pacific region and this is forecast to grow significantly (the Asia/Pacific region is already the world's largest air transport market with a 30 percent share in terms of Revenue Passenger Kilometres). In addition, maritime traffic is also increasing, adding further urgency to ensuring that States with oceanic SAR responsibilities in the region meet the requirements of both ICAO and IMO for the provision of aviation and maritime SAR services.

2.2 The world's citizens, who frequently fly over or sail through such remote areas, expect a timely and adequate SAR response to be provided should it be required. Asia/Pacific States who are signatories to the Chicago Convention accept the responsibility for the provision of SAR services per the requirements of Annex 12 to the ICAO Convention on International Civil Aviation and are responsible for the provision of SAR services over vast oceanic areas. However, the ICAO Asia/Pacific SAR Capability Matrix Table illustrates there are SAR capability gaps in the region with either the non-implementation or partial implementation of Annex 12 requirements. A number of States have not reported their SAR capability status at all.

2.3 States in the region need to be adequately prepared for the provision of efficient and effective SAR services. To assist in achieving this, it is essential for States to cooperate, collaborate and in some cases assist with resources to neighbouring and regional RCCs.

2.4 Recognising the deficiencies in capabilities of some States in the Asia/Pacific region to meet their responsibility of compliance under Annex 12, APANPIRG 2012 meeting established an Asia/Pacific Task Force (APSAR T/F) to produce an Asia/Pacific Search and Rescue Plan (APSAR Plan) to address those deficiencies.

2.5 This Plan is designed to address both military and civil SAR authorities and has been developed in consultation of Asia/Pacific States, SAR administrations and relevant International Organisations. States should consult with stakeholders nationally, regionally and internationally as appropriate and determine actions in order to commit to achieving the objectives of this SAR Plan in order to meet the minimum SAR service requirements of ICAO Annex 12. Where States are unable to meet the minimum SAR service requirements of ICAO Annex 12, this should be notified to ICAO as differences to the Annex 12 Standards and Recommended Practices (SARPs).

2.6 States do not need to meet their obligations all at once and it may be more productive to make gains in small steps commencing with actions that have a minimal cost (e.g. the establishment of a national SAR Committee and ensuring SAR Agreement are in place with neighbouring States), allowing for seamless cross-border transit of search assets engaged in SAR activity.

2.7 All States are encouraged to adopt this plan as a way forward, thus ensuring a timely, well-coordinated response to any SAR incident within their area of responsibility.

Plan Objective

2.8 The objective of the SAR Plan is to provide a framework to assist Asia/Pacific States in meeting their SAR needs and obligations accepted under the Convention on Civil Aviation and for the harmonised and interoperable delivery of both aeronautical and maritime SAR services within the Region, and across other ICAO Regional boundaries, when practicable.

2.9 The Plan is to be consistent with the SARPs of ICAO Annex 12 Search and Rescue, and aligned where appropriate with the SAR technical and operational measures and recommendations of the IMO.

2.10 The Plan recognizes that ICAO serves as the forum for the implementation of practical and achievable measures to improve SAR services for the civil air transportation system. The Plan also recognizes that the IMO provides a similar forum for SAR services to the maritime transportation system.

2.11 Both ICAO and IMO share the same goal of ensuring that SAR services are available globally wherever people sail or fly. The SAR services that ICAO and IMO promote are complimentary and offer tangible opportunities to derive mutually beneficial efficiencies for both the aviation and maritime transportation SAR systems globally, regionally and nationally. The objective of this Plan includes encouraging States to take advantage of such efficiencies

2.12 SAR plans describe how SAR services will be provided, organized and supported. SCs oversee and implement these documents. SAR plans should be signed by all Government agencies which can provide or support SAR services. These agencies should all be represented on the SCC which oversees these plans. **Expand SC and SCC**

Plan Development

2.13 The Regional Search and Rescue Plan was developed by the ICAO Asia/Pacific SAR Task Force consistent with the APANPIRG Terms of Reference which are:

- a) to ensure continuous and coherent development of the Asia/Pacific Regional Air Navigation Plan and other relevant regional documentation in a manner that is harmonized with adjacent regions, consistent with ICAO SARPs and Global Air Navigation Plan for CNS/ATM Systems (Doc 9750) and reflecting global requirements;
- b) to facilitate the implementation of air navigation systems and services as identified in the Asia/Pacific Regional Air Navigation Plan with due observance to the primacy of air safety, regularity and efficiency; and
- c) to identify and address specific deficiencies in the air navigation field.

2.14 The Regional Search and Rescue Plan was developed as part of a suite of Asia/Pacific air navigation plans, including the Regional ATM Contingency Plan, and the Seamless ATM Plan, so the Plan should not be considered in isolation.

2.15 The Plan is expected to provide guidelines and recommendations for Asia/Pacific States to consider for the enhancement and improvement of national, sub-regional and regional SAR capability including:

- Compliance with Annex 12 SARPs;
- Identification and addressing of deficiencies in SAR capability;
- Continuous and coherent development of SAR capability;
- Harmonisation of aeronautical and maritime SAR services;
- Remote oceanic SAR response capability;
- Establishment and review of arrangements between neighbouring States to expeditiously facilitate SAR coordination, operations and cooperation across regional boundaries including contingency procedures;
- Facilitation of the implementation of SAR systems and services including the establishment of JRCCs where suitable and practicable;
- Supporting the sharing of SAR information, data and expertise;

- Monitoring of outcomes from APANPIRG Sub-Groups, other ICAO Region SAR groups, ICAO/IMO SAR Joint Working Group and related forums for issues that may affect the APAC Region;
- Facilitation of a continuous reporting mechanism of State SAR capability, Annex 12 compliance and SAR performance data to the APAC Regional Office and the APANPIRG ATM/SG
- Implementation of a Quality Assurance program for SAR
- Coordinating the introduction of new technology affecting the regional SAR system,
- Sharing future research and development concepts
- Seeking efficiencies, through the coordination and facilitation of concurrent regional SAR meetings, seminars, workshops and exercises, including joint ICAO and IMO, and sub-regional forums where practicable; and
- Conducting efficient SAREX that identify improvements and latent problems.

2.16 The elements should be periodically reviewed by APANPIRG to ensure they remain relevant to the SAR system, particularly for new technology developments.

2.17 The Plan should be available in either hard copy or online formats as appropriate, to each RCC and SAR Authority. This publication may then supersede the requirement for SAR facilities information contained within Table SAR 1 in the Facilities and Services Implementation Document (FASID, Volume II of the Asia and Pacific Region Air Navigation Plan (Basic Air Navigation Plan, Doc 9673), subject to the endorsement of Asia/Pacific States.

EXECUTIVE SUMMARY

3.1 ICAO reported in December 2012 that 2.9 billion people used scheduled air transport services in 2012, with the annualized passenger figure up 5 per cent since 2011, and is expected to reach over 6 billion by 2030 according to current projections. The number of flights should also double, from 30 million to 60 million a year.

3.2 The Asia/Pacific region was the world's largest air transport market in 2012 with a 30 per cent share in terms of world Revenue Passenger Kilometres (RPKs).

3.3 Maritime traffic in the Asia/Pacific region is also increasing and whilst IMO sponsors the provision of maritime SAR services, the demand for aeronautical SAR services which frequently support responses to maritime SAR incidents is also likely to rise.

3.4 Asia/Pacific States who are signatories to the Chicago Convention accept the responsibility for the provision of SAR services per the requirements of Annex 12 Search and Rescue. Increases in both aviation and maritime traffic throughout the Asia/Pacific region places additional importance on the ability for States to be adequately prepared for potentially increased demand for aeronautical and maritime SAR services.

3.5 Considering that many of the Asia/Pacific States have the challenging responsibility for providing a SAR service over vast and remote oceanic areas, including three of the world's five oceans, the importance for States with oceanic SAR responsibility to cooperate, collaborate and share resources with their neighbouring and regional RCCs is essential.

3.6 In 2012 APANPIRG established the Asia/Pacific SAR Task Force (APSARTF) to assist with increasing discussion on SAR matters within APANPIRG and to develop a plan to address deficiencies in regional SAR capability. This Asia/Pacific SAR Plan was developed in accordance with Terms of Reference approved by APANPIRG.

3.7 High-level support might be necessary from regional bodies that can effectively support the Plan's implementation, such as the:

- Association of Southeast Asian Nations (ASEAN);
- Asia Pacific Economic Cooperation (APEC);
- South Asian Association for Regional Cooperation (SAARC); and
- Secretariat of the Pacific Community (SPC).

3.8 x.

Stakeholder Summary

3.9 This Plan addresses the full range of SAR stakeholders, including civil and military SAR authorities. The Plan has been developed in consultation with Asia/Pacific States, SAR administrations and relevant International Organizations (IO).

3.10 States should consult with stakeholders nationally, regionally and internationally as appropriate and determine actions in order to commit to achieving the objectives of this SAR Plan in order to meet the minimum SAR service requirements of ICAO Annex 12. Where States are unable to meet the minimum SAR service requirements of ICAO Annex 12, these should be notified to ICAO as differences to the Annex 12 SARPs.

3.11 x

ABBREVIATIONS AND ACRONYMS

APANPIRG	
ARCC	Aeronautical Rescue Coordination Centre
ATM	Air Traffic Management
JRCC	Joint Rescue Coordination Centre
MRCC	Maritime Rescue Coordination Centre
RCC	Rescue Coordination Centre
SAR	Search and Rescue
SARPs	Standards and Recommended Practices
SRR	Search and Rescue Region

4.1 XXX

TO BE COMPLETED ON FINAL EDIT

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BACKGROUND INFORMATION

APSAR/TF

5.1 APANPIRG/23 (Bangkok, Thailand, 10-14 September 2012) agreed to the following Decision:

Decision ATM/AIS/SAR/SG/22-12 – Establishment of APSAR Task Force

That, an Asia/Pacific Regional SAR Task Force (APSAR/TF) be established, reporting to the ATM Sub-Group of APANPIRG, in accordance with the Terms of Reference as shown in Appendix I to the Report on Agenda Item 3.2

5.2 The First Meeting of the Asia/Pacific Regional Search and Rescue Task Force (APSAR/TF/1) was held in Bangkok from 5 to 7 February 2013.

Improvement Drivers

5.3 The next generation of 406MHz distress beacons represented a dramatic step forward, with accuracies of 100m or less, and constant alerting, so it was important to start planning for this implementation starting in 2015.

5.4 The need to ensure States register 406 MHz distress beacons, and, that the register is available to both aeronautical and maritime RCCs can be associated with Annex 12 – *Search and Rescue*. However, it is Annex 10 which provides the requirement. States should note that Annex 12 should be read in conjunction with the following ICAO Annexes:

Annex 6 – Operation of Aircraft: Part I International Transport (cargo and passenger aircraft), Chapter 6 in general and ELT in particular; Part II International General Aviation, Chapter 6 in general and ELT in particular; and Part III Helicopters, Chapter 4;

Annex 10 – Aeronautical Telecommunications (discussed above); and

Annex 14 – Aerodromes: Chapter 9 regarding aerodrome emergency planning; exercises; and, establishment, testing and assessment at regular intervals of a predetermined response for the specialist rescue services.

5.5

[Include material from the SG Meeting 2012, APSARTF1, HLSC, others?]

CURRENT SITUATION

Asia/Pacific SAR Capability Analysis

6.1 The following **Figure X** depicts Asia/Pacific and adjoining FIRs and SRRs.

Figure X: Asia/Pacific and adjoint FIRs/SRRs

6.2 In this Section there should be a statement of SAR capability and barriers, issues, etc. This can largely come from the SAR/TF/3 report. However all known issues should be detailed here if already clear.

Asia/Pacific SAR Coordination Forums

6.3 The Asia/Pacific Region will benefit from the cooperation and coordination of States and International Organizations involved in the APSAR/TF. After the APSAR/TF completes its tasks, the establishment of permanent joint ICAO/IMO Regional SAR Forums to enable collaboration and cooperation on oceanic SAR matters across the specific oceanic regions and including adjacent ICAO regions is considered imperative, such as:

- a) Pacific Ocean SAR Forum – including Pacific States of the Asia/Pacific, North American and South American regions; and
- b) Indian Ocean SAR Forum – including Indian Ocean States of the Asia/Pacific, East African and Middle East regions.

Barriers

6.4 The following potential issues should be considered to ensure they do not become barriers to the achievement of the expected SAR capability:

- c) establishment of an appropriate legal framework designating, recognizing and giving authority to national SAR authorities;
- d) funding and equipping SAR authorities and in particular, resourcing the RCC;
- e) setting of appropriate SAR organizational framework;
- f) establishment of a National SAR Committee;
- g) clarity of responsibilities for each component of the SAR system, and empowerment of the RCC;
- h) establishment of SAR Agreements; and
- i) lack of recognition of the importance of SAR.

6.5 The provision of sufficient resources was critical in a number of areas, including:

- a) financial-
 - i. funding for 24 hour RCC facility and staff;
 - ii. funding for use/hire of search and rescue units; and
 - iii. Provision of a suitable administrative process enabling financial support including the ability for SAR authorities to quickly authorise payments required for emergency response aircraft, vessels and supporting logistics such as fuel.
- b) RCC personnel- a suitable number of trained and skilled staff;
- c) RCC facilities-
 - i. appropriate RCC facility space (Australia to add recommended metre space and RCC minimum equipment list – this could be an Appendix);
 - ii. minimum RCC tools (such as current charts, plotting equipment, documentation, etc.);
 - iii. reliable and rapid H24 communications, and a suitable means to-
 - 1. receive and communicate distress alerts
 - 2. communicate with ATS units, other RCCs/RSCs, Coast Radio Stations, COSPAS-SARSAT Mission Control Centres (MCCs), military units, medical services, meteorological offices, etc.; and
 - 3. identify and task available SRUs.
 - iv. information technology-
 - 1. RCC workstation computers;
 - 2. Software including basic databases, drift modelling, incident management, etc.; and
 - 3. Aircraft and vessel tracking information including ADS-B, AIS, etc.
- d) Search and Rescue Units (SRUs)-
 - i. available and suitable SAR aircraft and crews;

- ii. funding arrangements/agreements for hiring/payment/sharing of SRUs to permit rapid deployment; and
 - iii. Available and suitable SAR survival equipment for delivery by aircraft to survivors and to assist SAR coordination efforts (eg SAR Datum Buoys);
- e) Training support-
 - i. RCC staff – basic and ongoing; and
 - ii. SRU crews – pilots, air crew and air observers.

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PERFORMANCE IMPROVEMENT PLAN**Preferred SAR Capability Specifications (PSCS)*****PSCS Phase I (expected implementation by 9 November 2018)***Organisation

7.1 All States should develop statutes and related provisions that establish or enhance the legal foundation for a State SAR organization and its framework, resources, policies and procedures to:

- a) ensure that it is party to the following Conventions, as applicable –
 - i.....C
Convention on International Civil Aviation 1944;
 - ii.....I
International Convention on Maritime Search and Rescue, 1979;
 - iii.....I
International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended;
 - iv.....C
Convention on the High Seas, 1958; and
 - v.....U
United Nations Convention on the Law of the Sea (UNCLOS), 1982;
- b) unless delegated by written agreement, establish an entity that provides, on a 24-hour basis, SAR services within its territories and designated area of responsibility;
- c) establish a National SAR Committee consisting of civil and where applicable, military members;
- d) establish a single State SAR point of contact (SPOC) for non-urgent, administrative matters, such details to be submitted to the ICAO Regional Office;
- e) conduct studies to integrate aviation and maritime SAR activities, and as far as practicable, civil and military activities, including joint training of staff and review of documentation to ensure harmonisation of procedures, and joint exercises;
- f) conduct studies to align, as far as practicable, aeronautical and maritime Search and Rescue Regions (SRRs); and SRRs and Flight Information Regions (FIRs); and
- g) establish a single State SAR Plan that –
 - i.....d
describes the relevant SRRs, including the limits for any SRRs;
 - ii.....d
details the National SAR Committee;
 - iii.....d
details the governmental and non-governmental agencies with authority and responsibility for SAR coordination within its territories and designated area of responsibility;
 - iv.....d
details required and available SAR facilities, personnel, and equipment;
 - v.....d

etails the SAR manuals, plans and procedures for national and regional cooperative SAR response arrangements;

- vi.....d
etails the SAR personnel training and competency programme, qualification standards, SAR certification if applicable and SAR cooperation training;
- vii.....d
etails a single SAR point of contact for non-urgent, administrative matters;
- viii.....d
etails the SAR agreements required;
- ix.....i
s electronic and accessible on the Internet, such details to be submitted to the ICAO Asia/Pacific Regional Office; and
- x.....i
s controlled by quality assurance processes.

Procedures and Training

7.2 All States should:

- a) ensure robust SAR Alerting procedures are in place, tested and fully integrated with RCC procedures so that RCCs are rapidly notified of any SAR event 24 hours a day;
- b) establish aerodrome emergency plans to provide for co-operation and co-ordination with RCCs;
- c) establish SAR Agreements with States having adjoining SRRS or FIRs, including trans-regional neighbours;
- d) provide cross-border information on SAR capability. (This should be included in bilateral SAR agreements per Annex 12.);
- e) pre-arrange procedures for cross-border SAR responses. (This should be included in bilateral SAR agreements per Annex 12.);
- f) establish contingency procedures for delegation of SAR responsibility where such service is not able to be provided, or in contingency (temporary) circumstances;
- g) establish a program for an annual SAREX in each sub-region (South Asia, Southeast Asia, East Asia and the Pacific). Every second year should be a desktop communications exercise, alternate years being a full exercise;
- h) develop regional SAR training modules for RCC SAR Mission Coordinators (SMCs) and SAR Coordinators with the JWG;
 - develop individual competency assessments for SMC during operational duty and SAREX; and
 - study the feasibility of establishing a joint ICAO/IMO Regional SAR Training Team to assist States unable to provide their own SAR training. *(Comment: there is a large demand for this regionally however States have difficulty providing it to their own RCCs – funding and availability of SAR training expertise in country seem to be the main issues. Needs ICAO/IMO support.)*

7.3 All State SAR coordination plans should include procedures for joint aeronautical and maritime distress alert notification, support and response to both aircraft and shipping SAR incidents, including protocols for civil and military support and sharing of resources.

- 7.4 All States should establish procedures enabling:
- a) availability and deployment of suitably crewed and equipped SRUs, public and/or private, civil and military, for rapid SAR response;
 - b) availability and deployment of SRU craft that may be in use for another primary purpose but made available to RCCs for SAR purposes on an as needed emergency basis;
 - c) protocols to request assistance of military assets and similarly military SAR authorities allowed to request civil assets;
 - d) cooperative use and/or sharing of SAR assets with protocols incorporated within National SAR Plans and bilateral SAR Agreements; and
 - e) pre-arranged funding of costs associated with hiring of SRUs to avoid any delays in response availability.

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7.5 All States should establish RCC plans for response to Mass Rescue Operations (MROs) integrated with national disaster plans.

Facilities

7.6 All States should establish RCCs of sufficient size and facilities commensurate with the guidance in **Appendix XX**.

7.7 All States should evaluate the possibility and feasibility of establishing Joint RCCs (JRCCs) to incorporate the aeronautical and maritime SAR activities and/or facilities of ARCCs and MRCCs. Where not practicable, development of facilities and procedures which provide and/or enhance effective SAR coordination and collaboration between the ARCCs and MRCCs in support of each other.

7.8 Where practicable, the evaluation may consider consolidation of two or more different State RCCs into single sub-regional JRCCs.

7.9 For RCCs with responsibility for oceanic areas, all States should establish additional oceanic SAR capability to ensure a timely and adequate SAR response is available to all oceanic areas of their SRRs.

7.10 All States should provide tools that assist RCCs to provide an improved service such as:

- a) joint aeronautical and maritime electronic mapping;
- b) maritime broadcast facilities;
- c) shipping/vessel communications – Coast Radio Stations, RCC radio and satellite communications, marine radio networks;
- d) aircraft communications – via ATS units, aircraft operators, satellite communications;
- e) access to live aircraft and ship tracking data, e.g. ADS-B (aviation), AIS (maritime) allowing rapid identification of potential aircraft and vessels that may divert to assist;
- f) drift modelling software;
- g) ocean data including sea temperature, currents, winds, tides, etc;
- h) SAR Datum Buoys, preferably with satellite tracking capability; and
- i) RCC recording and plotting of search object sightings and debris.

7.11 All States should ensure that SRU aircraft have:

- a) marine VHF radio to enable communication with vessels if used over marine areas;
- b) direction-finding capability for locating distress beacons;
- c) the capability of delivering/dropping SAR supplies to survivors and other SAR equipment (e.g. SAR Datum Buoys);
- d) trained air search observers; and
- e) night search capability including night-vision devices where appropriate.

7.12 All States should establish a regional publication which depicts both aeronautical and maritime SRRs geographically in chart format. This publication should be available for all aeronautical and maritime RCCs, ATS units, aircraft operators and (others?) in hard copy and/or online format to enable rapid determination of the responsible RCC for any distress alert.

7.13 All States should establish a centralised information source publishing all Asia/Pacific State Aeronautical Information Publication (AIP) information as required by ICAO Annex 15 Appendix 1, page APP 1-8 including:

- a) The agency responsible for providing SAR services;
- b) The area of SAR responsibility where SAR services are provided;
- c) The type of SAR services and facilities provided including indications where SAR aerial coverage is dependent upon significant deployment of aircraft;
- d) SAR agreements;
- e) The conditions of SAR facility and service availability; and
- f) SAR procedures and signals used.

7.14 All States should establish a web-based SAR Library, or cooperate by contributing to an Internet-based Asia/Pacific resource.

7.15 All States should develop and maintain a current, comprehensive electronic list of State SAR Facilities, SAR Equipment, and SAR Units (SRUs), including joint or shared facilities and equipment, and provide the Internet link to that list to the ICAO Asia/Pacific Regional Office.

SAREX

7.16 All States should conduct regular SAREXs (at least once every two years) to test and evaluate:

- a) oceanic SAR response procedures including both aeronautical and maritime SAR authorities, civil and military;
- b) where appropriate, cross-SRR boundary coordination (SAREX should routinely involve SAR authorities of adjacent SRRs, especially if the area concerned is within 50NM of the SRR boundary);
- c) SAREX effectiveness through a post-SAREX review and written report, completed to ensure that deficient areas or latent problems were identified and remedied. Note: a SAREX template is provided at [Appendix X](#).

COSPAS-SARSAT Distress Beacon System

7.17 All States should :

- a) have a reliable distress beacon registration system in place which includes up to date registration details for all national civil and military ELTs, EPIRBs and PLBs;
- b) Maintain a distress beacon register with details available and accessible to RCCs 24 hours a day;
- c) establish a plan for the introduction of new generation 406MHz distress beacons Receiver capability; and
- d) where separate ARCCs and MRCCs exist with responsibility for coincident aviation and maritime SRRs, States should coordinate distress beacon alert procedures to ensure both RCCs are aware of any distress beacon activations within their areas to avoid duplication of response. MRCCs should ensure the procedures alert ARCCs and ATS units to any EPIRB activations.

System Improvement

- 7.18 All States should establish quality assurance procedures that –
- a) provides performance and safety indicators, including post-incident/accident lessons learned and management reviews (RCC and SAR System Continuous Improvement process), and feedback from RCC staff, SAR system users or SAR stakeholders;
 - b) identifies corrective and preventive actions that prevent or minimise the possibility of substandard SAR performance;
 - c) establishes an internal quality assurance programme, which includes regular internal audits of the SAR facilities and procedures that are conducted by trained auditors;
 - d) ensures the person responsible for internal quality assurance within the entity responsible for SAR services has direct access to report to the Chief Executive of the entity responsible for SAR services on matters of quality assurance.
- 7.19 All States should conduct an annual or more frequent analysis of their current State SAR system to identify specific gaps in capability against the minimum requirements of Annex 12 and the guidelines of the IAMSAR Manual to:
- a) enable the ICAO Asia/Pacific SAR data to be updated to accurately reflect the State's capability;
 - b) analyse the level of consistency of SAR services in neighbouring States;
 - c) identify SAR research and development programmes, conducted if possible in cooperation with other States;
 - d) establish a common set of basic SAR system statistics, which include-
 - i. number of SAR incidents per year;
 - ii. number of lives at risk versus number of lives saved;
 - iii. time from first alert to arrival on scene of first SRU; and
 - iv. time from first alert to rescue;
 - e) plan for any necessary improvements and compliance to gradually build and improve capability over time, which would be detailed in the State SAR Plan; and
 - f) update SAR agreements as appropriate.
- 7.20 All States should conduct SAR promotion programs to:
- a) assist media understand SAR operations to minimise the need to explain during SAR responses;
 - b) ensure support of SAR facilities and improvements by decision-makers;
 - c) encourage higher SAR preparedness by persons that may require SAR services;
 - d) enhance cooperation between SAR services and –
 - i. military and police agencies;
 - ii. air traffic control facilities;
 - iii. aerodrome and port operators;
 - iv. aircraft and shipping operators;
 - v. meteorological agencies;

- vi. government and non-government agencies affected by SAR operations; and
 - vii. other States.
- e) recognise improvement in State SAR systems.

Contingency Facilities and Procedures

7.21 All States should ensure there are established contingency facilities, or when a SAR service is not able to be provided, procedures in place for the temporary delegation of the SAR responsibility to another appropriate body or State.

7.22 All States should test their contingency arrangements periodically, but not less than once a year.

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RESEARCH AND FUTURE DEVELOPMENT

Research and Development

8.1 To develop the tools and systems required to meet foreseeable long-term requirements, there is a need for States to undertake and co-operate on SAR. This includes major efforts to define concepts, to extend knowledge and invent new solutions to future SAR challenges so these new concepts are selected and applied in an appropriate timely manner. Such efforts could be forged through collaborative partnerships between, States, ANSPs, International Organizations, institutes of higher learning and specialised technical agencies. This concept is consistent with Seamless ATM Principle 36 (*Inter-regional cooperation ('clustering') for the research, development and implementation of ATM projects*).

8.2 With the end goal of a globally interoperable SAR system in mind, the region will have to consider planning for a long term supporting concept and infrastructure. The following are possible areas that should be considered for future SAR research and development, in order to promote the maximum possible harmonisation and interoperability of SAR systems:

- a) real time automated data link communication to RCCs when an aircraft or ship exceeds a Variable Set Parameter (VSP) in terms of its operating envelope, or activation of an emergency status (could be displayed as a symbol, and the data could include certain operating parameters such as acceleration and altitude for an aircraft);
- b) regional Unmanned Aerial Systems (UAS) SAR capability;
- c) location accuracy requirement for accident site for certain categories of aircraft;
- d) ELT activation while in-flight by the new generation of satellites and ground stations in the Cospas-Sarsat System;
- e) new generation beacon which uses 406MHZ for homing capability; and
- f) enhanced technology oriented systems to improve SAR system effectiveness.

MILESTONES, TIMELINES, PRIORITIES AND ACTIONS

Milestones

9.1 Section 7 (Performance Improvement Plan) provides milestones and timelines for a number of elements in the PSCS Phase I and II, being effective 12 November 2015 and 09 November 2018 respectively.

9.2 It should be noted that States should commence planning for the various PSCS elements. This should be planned from the approval of this Plan, to ensure a smooth transition by the onset of Phase I, and should include consideration of issues such as:

- safety/operational analysis and assessment;
- cost-effectiveness;
- budgetary issues;
- development of operational procedures; and
- training.

9.3 Section 8 (Research and Future Development) provides, subject to future agreement by concerned parties, possible SAR improvements beyond 2018 until 2028.

Priorities

9.4 It is a matter for each State to determine priorities in accordance with its own economic, environmental, safety and administrative drivers.

Actions

9.5 This Plan necessitated a number of implementation actions. It is expected that each Asia/Pacific State report progress on each applicable element to APANPIRG.

9.6 Section 6 (Current Situation) provides detailed analysis and major concerns in the region, which should be considered in the formulation of specific State plans.

SAREX

9.7 A program is expected to be established for an annual SAREX in each sub-region (South Asia, Southeast Asia, East Asia and the Pacific), with every second year being a desktop communications exercise, and alternate years being a full exercise. The Exercise outcomes and lessons learned should be reported to APANPIRG through the ATS Sub-Group.

9.8 The ICAO Asia and Pacific Regional Office is responsible for taking actions that assist the implementation of SAR within its accredited States, in coordination with the IMO. In addition, the Asia and Pacific Regional Office coordinated with adjacent ICAO regional offices on an ad hoc basis or at relevant trans-regional meetings.

APPENDICES

LIST OF IMO DOCUMENTS AND PUBLICATIONS WHICH SHOULD BE HELD BY A MARITIME RESCUE COORDINATION CENTRE

REFERENCE	DATE	TITLE
1 Publications		
All following publications are available (to be purchased) on: http://www.imo.org/Publications/Documents/Attachments/Welcome.pdf		
IE-110 A/C/E/F/R/S	2009	International Convention for the Safety of Life at Sea (SOLAS) (Consolidated Edition, 2009)
I-175 A/C/E/F/R/S	2009	SOLAS Amendments 2008 and 2009
I-176 A/C/E/F/S	2011	SOLAS Amendments 2010 and 2011 (2011 edition)
IB-955 A/C/E/F/R/S	2006	SAR Convention (2006 edition)
IH-960 E/F/S	2013	International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volume I (2010 edition) – Organization and Management
IE-961 E/F/S	2013	International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volume II (2010 edition) – Mission Coordination
IH-962 E/F/S	2013	International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volume III (2010 edition) – Mobile Facilities
IE-970 E	2011	GMDSS Manual (2011 edition)
I-969 E	1992	GMDSS Operating Guidance Card (1992 edition)
IA-987 E/F/S	2005	IMO Standard Marine Communication Phrases (SMCP) – (including CD-ROM: pronunciation guide) (2005 edition)
IB 908 E/F/S	2011	*International SafetyNET Manual (2011 edition)
ID 951 E/F/S	2012	**NAVTEX Manual (2012 edition)
I-910 M	2010	Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI) (2010 edition)
IA-994 E/F/S	2005	International Code of

II-200 E/F/S	2012	Signals (2005 edition) International Maritime Dangerous Goods Code (IMDG Code) (2012 edition) (incorporating amendment 36-10)
IH-210 E/F/S	2010	IMDG Code Supplement (2010 edition)

2 Unpublished documents

Following Assembly resolutions and MSC Circulars are available for free at:

<http://www.imo.org/KnowledgeCentre/IndexofIMOResolutions/Pages/Default.aspx>

COMSAR Circulars are available for free at (IMODOCS):

<http://docs.imo.org/Category.aspx?cid=376>

Res. A.705(17), as amended (MSC.1/Circ.1287.Rev.1)	06/11/91	Promulgation of Maritime Safety Information (MSI)
Res. A.706(17), as amended (MSC.1/Circ.1288.Rev.1)	06/11/91	World-Wide Navigational Warning Service
Res. A.814(19)	23/11/95	Guidelines for the Avoidance of False Distress Alerts
Res. A.855(20)	27/11/97	Standards for onboard helicopter facilities
Res. A.856(20)	27/11/97	Guidance to Administrations on development of a shore- based SAR telecommunication infrastructure
Res. A.887(21)	25/11/99	Establishment, updating and retrieval of the information contained in the registration databases for the Global Maritime Distress and Safety System (GMDSS)
Res. A.894(21)	25/11/99	International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual
Res. A.919(22)	29/11/01	Acceptance and implementation of the International Convention on Maritime Search and Rescue, 1979, as amended
Res. A.920(22)	29/11/01	Review of safety measures and procedures for the treatment of persons rescued at sea
Res. A.949(23)	05/12/03	Guidelines on places of refuge for ships in need of assistance
Res. A.950(23)	05/12/03	Maritime Assistance Services (MAS)
Res. A.954(23)	05/12/03	Proper use of VHF channels at sea
Res. A.999(25)	29/11/07	Guidelines on voyage

Res. A.1001(25)	29/11/07	planning for passenger ships operating in remote areas Criteria for the provision of mobile-satellite communication systems in the Global Maritime Distress and Safety System (GMDSS)
Res. A.1044(27)	30/11/11	Piracy and armed robbery against ships in waters off the coast of Somalia
Res. A.1051(27)	20/12/11	IMO/WMO Worldwide Met-Ocean Information and warning Service – Guidance Document
Res. MSC.131(75)	21/05/02	Maintenance of a continuous listening watch on VHF channel 16 by SOLAS ships whilst at sea after 1 February 1999 and installation of VHF DSC facilities on non-SOLAS ships
Res. MSC.167(78)	20/05/04	Guidelines on the treatment of persons rescued at sea
Res. MSC.199(80)	16/05/05	Adoption of amendments to provision of radio services for the Global Maritime Distress and Safety system (GMDSS) – (resolution A.801(19))
Res. MSC.239(83)	12/10/07	Adoption of amendments to the International Convention for the Safety of Life at Sea, 1974, as amended (relating to GMDSS satellite providers)
Res. MSC.305(87)	17/05/10	Guidelines on Operational Procedures for the promulgation of Maritime Safety Information concerning acts of Piracy and Piracy counter-measure operations
COMSAR/Circ.3	19/04/96	Relations between NAVAREA Coordinators and Rescue Coordination Centres
COMSAR/Circ.13	06/03/98	Shore-to-ship communications during a distress
COMSAR/Circ.22	20/06/00	Guidance on data fields for SAR databases
COMSAR/Circ.23	20/06/00	Guidance for central alerting

COMSAR/Circ.25	15/03/01	posts (CAPs) Procedure for responding to DSC distress alerts by ships
COMSAR/Circ.29	27/05/02	Guidance for the voluntary use of the standardized questionnaires and formats for reporting false alerts in collecting data on false alerts
COMSAR/Circ.31	06/02/03	Guidance for Mass Rescue Operations (MROs)
COMSAR/Circ.35	21/05/04	Recommendations on medium frequency/high frequency (MF/HF) digital selective calling (DSC) test calls to coast stations
COMSAR/Circ.37	28/02/05	Guidance on minimum communication needs of Maritime Rescue Coordination Centres (MRCCs)
COMSAR.1/Circ.41	16/10/07	Analysis of Maritime Safety Information Promulgated via the EGC SafetyNET system and recommendations on improving its quality
COMSAR.1/Circ.45	04/02/09	Guidance on distress alerts
COMSAR.1/Circ.53/Rev.1	27/06/11	List of Land Earth Station (LES) Operation Coordinators in the Inmarsat System
COMSAR.1/Circ.50/Rev.3	13/01/12	*Distress priority communications for RCC from shore to ship via Inmarsat
COMSAR.1/Circ.51/Rev.3	18/01/12	List of NAVAREA Coordinators
COMSAR.1/Circ.55	30/11/12	Guidance for entering and updating information on search and rescue services into GISIS and on how to get access to the information for operational use
COMSAR.1/Circ.56	30/11/12	Guidance on smartphone and other computer device SAR applications
MSC/Circ.805	06/06/97	Guidance for the use of radio signals by ships under attack or threat of attack from pirates or armed robbers
MSC/Circ.895	04/02/99	Recommendation on helicopter landing areas on ro-ro passenger ships

MSC/Circ.896/Rev.1	12/06/01	Interim measures for combating unsafe practices associated with the trafficking or transport of migrants by sea
MSC/Circ.960	20/06/00	Medical assistance at sea
MSC/Circ.1042	28/05/02	List of contents of the "Emergency Medical Kit/Bag" and medical consideration for its use on ro-ro passenger ships not normally carrying a medical doctor
MSC/Circ.1043	31/05/02	Guidance on ships' daily reporting of their positions to their companies
MSC/Circ.1073	10/06/03	Measures to enhance maritime security – Directives for maritime rescue coordination centres (MRCCs) on acts of violence against ships
MSC/Circ.1078	06/06/03	Guidelines to Administrations on reporting false alerts
MSC/Circ.1079	10/07/03	Guidelines for preparing plans for cooperation between search and rescue services and passenger ships (in accordance with SOLAS regulation V/7.3)
MSC/Circ.1105	25/02/04	Guidance on responsibility and liability issues related to the use of the emergency medical kit/bag and evaluation of its use in emergency incidents
MSC/Circ.1172	23/05/05	Identification of passenger ships, other than ro-ro passenger ships, which should benefit from being equipped with the Emergency Medical Kit/Bag (EMK)
MSC.1/Circ.1182	31/05/06	Guide to recovery techniques
MSC.1/Circ.1183	31/05/06	Guidelines on the provision of external support as an aid to incident containment for SAR Authorities and others concerned
MSC.1/Circ.1184	31/05/06	Enhanced contingency planning guidance for passenger ships operating in

		areas remote from SAR facilities
MSC.1/Circ.1185/Rev.1	23/05/12	Guide for cold water survival
MSC.1/Circ.1186	01/06/06	Guidelines on the training of SAR service personnel working in major incidents
MSC.1/Circ.1208	22/05/06	Promoting and verifying continued familiarization of GMDSS operators on board ships
MSC.1/Circ.1210	11/07/06	Cospas-Sarsat International 406 MHz Beacon Registration Database
MSC.1/Circ.1218	15/12/06	Guidance on exchange of medical information between telemedical assistance services (TMAS) involved in international SAR operations
MSC.1/Circ.1248	16/10/07	Minimizing delays in search and rescue response to distress alerts
MSC.1/Circ.1287/Rev.1	June 2013	Amendments to resolution A.705(17) – Promulgation of Maritime Safety Information
MSC.1/Circ.1288/Rev.1	June 2013	Amendments to resolution A.706(17) – World-Wide Navigational Warning Service
MSC.1/Circ.1333	26/06/09	Recommendations to Governments for preventing and suppressing piracy and armed robbery against ships
MSC.1/Circ.1334	23/06/09	Guidance to shipowners and ship operators, shipmasters and crews on preventing and suppressing acts of piracy and armed robbery against ships
MSC.1/Circ.1338	01/03/11	Guidance to search and rescue services in relation to requesting and receiving LRIT information
MSC.1/Circ.1364	24/05/10	Revised International SafetyNET Manual
MSC.1/Circ.1365	24/05/10	Commercially available locating, tracking and emergency notification devices
MSC.1/Circ.1367	24/05/10	Amendments to the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual
MSC.1/Circ.1382	03/12/10	Questionnaire on the availability of shore-based

MSC.1/Circ.1403	23/05/11	facilities in the GMDSS Revised NAVTEX Manual Principles and Guidelines relating to the review and audit of the performance of LRIT Data Centres and the International LRIT Data Exchange (Principles and Guidelines)
MSC.1/Circ.1412	28/05/12	
MSC.1/Circ.1413	25/05/12	Basic safety guidance for yacht races or oceanic voyages by non-regulated craft
MSC.1/Circ.1415	25/05/12	Amendments to the IAMSAR Manual
GMDSS.1/Circ.14	18/12/12	Master Plan of shore-based facilities for the GMDSS (GMDSS Master Plan)
SAR.8/Circ.4	01/12/12	Global SAR Plan containing information on the current availability of SAR services
SAR.7/Circ.11	2013	List of IMO documents which should be held by an MRCC
Non-IMO documents		
ITU List IV E/F/S	November 2011	List of Coast Stations and Special Service Stations (List IV) [on CD-ROM] can be purchased at: http://www.itu.int/pub/R-SP-LM/en
ITU List V E/F/S	April 2012	List of Ship Stations and Maritime Mobile Service Identity Assignments (List V) [on CD-ROM] free of charge access using: brtpr@itu.int , http://www.itu.int/ITU-R/go/mars/en
ITU MARS E/F/S	Updated daily	Maritime online access and retrieval system (MARS) containing the same information as in List IV and List V above http://www.itu.int/ITU-R/index.asp?category=terrestrial&rlink=mars&lang=en
Cospas-Sarsat – C/S G.007	October 2012	Handbook on Distress Alert Messages for RCCs, SPOCs and IMO Ship Security Competent Authorities (issue 1/Rev.3) Available for free at: http://www.cospas-

ARNP

sarsat.org/images/stories/SystemDocs/Current/cs_g007_oct_2012.pdf

List of Radio Signals
Non-IMO document

Air Regional Navigation Plans (ARNP)
<http://www.icao.int/safety/ANP/Pages/Air-Navigation-Plans.aspx>

National documents related to national requirement

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