



Civil Aviation Authority of Singapore

Manual of Standards - Search and Rescue

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AMENDMENT RECORDS

The amendments listed below have been incorporated into this copy of the Manual of Standards – Search and Rescue.

Amendment no.	Version no.	Subject	Source	Sections affected	Entered by (Date)	Approved by (Date)	Effective date
-	1.0	Original Version	ICAO Annex 12 (incorporating Amdt 18)	All	Samuel Ko (1 October 2009)	Loo Chee Beng (1 October 2009)	1 October 2009
1	1.1	Table of Contents Foreword Introduction List of Effective Pages Organisation Preparatory measures	Arising from AAR Div's continual review of the MOS-SAR	(page re-numbered) Amendments to the Foreword Chp 1 Para 1.2.2 to Para 1.2.7 (deleted) Chp 2 Para 2.7 Chp 4 Para 4.4.2 to Para 4.4.4	Samuel Ko (7 May 2010)	Loo Chee Beng (7 May 2010)	7 May 2010
2	2.0	-	Ministerial Directions No. 1/2010	-	AAR Div (30 July 2010)	Chief Executive (30 July 2010)	30 July 2010

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FOREWORD

Pursuant to paragraph 5 of the Ministerial Direction No. 01/2010 [as amended by the CAAS (ANS) (Amendment) Directions 2011], this Manual of Standards – Search and Rescue is issued by CAAS specifying the national standards and requirements to be met by the provider or coordinator of search and rescue services within the Singapore Search and Rescue Region to meet the search and rescue obligations of Contracting States to the Convention on International Civil Aviation.

The standards and recommended practices in this Manual are based on those stipulated in Annex 12 (entitled “Search and Rescue”) to the Convention on International Civil Aviation [as in force and amended from time to time by the Council of the International Civil Aviation Organisation (ICAO)] and other relevant ICAO documents, and with such modifications as may be determined by CAAS to be applicable in Singapore.

Amendments to this Manual of Standards – Search and Rescue are the responsibility of the Division Head of the Aerodrome and Air Navigation Services Regulation Division. Readers should forward advice of errors, inconsistencies or suggestions for improvement to this Manual to the addressee stipulated below.

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DEFINITIONS and ABBREVIATIONS

Definitions

Alerting post

Any facility intended to serve as an intermediary between a person reporting an emergency and a rescue coordination centre or rescue subcentre.

Alert phase

A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

Distress phase

A situation wherein there is a reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger and require immediate assistance.

Ditching

The forced landing of an aircraft on water.

Emergency phase

A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.

Joint rescue coordination centre

A rescue coordination centre responsible for both aeronautical and maritime search and rescue operations.

Operator

A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Pilot-in-command

The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

Rescue

An operation to retrieve persons in distress, provide for their initial medical or other needs, and deliver them to a place of safety.

Rescue coordination centre

A unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region.

Rescue subcentre

A unit subordinate to a rescue coordination centre, established to complement the latter according to particular provisions of the responsible authorities.

Search

An operation normally coordinated by a rescue coordination centre or rescue subcentre using available personnel and facilities to locate persons in distress.

Search and rescue aircraft

An aircraft provided with specialized equipment suitable for the efficient conduct of search and rescue missions.

Search and rescue facility

Any mobile resource, including designated search and rescue units, used to conduct search and rescue operations.

Search and rescue organisation

The provider of search and rescue services within the Singapore search and rescue region.

Search and rescue service

The performance of distress monitoring, communication, coordination and search and rescue functions, initial medical assistance or medical evacuation, through the use of public and private resources, including cooperating aircraft, vessels and other craft and installations.

Search and rescue region

An area of defined dimensions, associated with a rescue coordination centre, within which search and rescue services are provided.

Search and rescue unit

A mobile resource composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue operations.

State of Registry

The State on whose register the aircraft is entered.

Uncertainty phase.

A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

Abbreviations

AAR	Aerodrome and Air Navigation Services Regulation
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
ATC	Air Traffic Control
ATS	Air Traffic Services
FIR	Flight Information Region
IAMSAR	International Aeronautical and Maritime Search and Rescue
ICAO	International Civil Aviation Organisation
MOS	Manual of Standards
RCC	Rescue Coordination Centre
SAR	Search and Rescue
SRR	Search and Rescue Region

Chapter 1 – INTRODUCTION

1.1 General

1.1.1 Search and Rescue (SAR) comprises the search for and provision of aid to persons who are, or are believed to be in imminent danger of loss of life. The two operations – search and rescue – may take many forms, depending on whether they are both required or not, on the size and complexity of the operation and on the available staff and facilities.

1.1.2 This Manual of Standards – Search and Rescue (MOS-SAR) provides standards and requirements for the establishment, maintenance and operation of search and rescue services within Singapore Search and Rescue Region (SRR). The primary purpose of the MOS-SAR is to ensure that the SAR organisation meets the search and rescue needs and obligations under the Convention on International Civil Aviation.

1.1.3 The SAR organisation should develop and improve its SAR services, co-operate with neighbouring States and to consider the SAR services to be part of a global system.

1.2 Manual of Standards – Search and Rescue

1.2.1 This Manual should be read in conjunction with:

- (a) ICAO Annex 12 – Search and Rescue
- (b) ICAO Annex 13 – Aircraft Accident and Incident Investigation
- (c) IAMSAR Manual Vol 1 – Organisation and Management
- (d) IAMSAR Manual Vol II – Mission Co-Ordination
- (e) IAMSAR Manual Vol III – Mobile Facilities
- (f) ICAO Doc 7030 – Regional Supplementary Procedures for Alerting and SAR services applicable in the SEA Region

1.2.2 Where there is a difference between a standard in this Manual and that of the above-mentioned ICAO documents, the standard in this Manual shall prevail.

1.2.3 In this Manual, standards are preceded by the word “shall”, whereas recommended practices are preceded by the word “should”. The SAR organisation shall comply with all standards at

all times and should endeavour to comply with all recommended practices.

- 1.2.4 When the SAR organisation is not able to comply with any standards specified or referenced in this Manual, the SAR organisation shall apply to AAR Division for exemption or deviation from the relevant standards. Applications shall be supported in writing with the reasons for such exemption or deviation including any safety assessment or other studies undertaken, and where appropriate, an indication of when compliance with the current standards can be expected.
- 1.2.5 When the SAR organisation is not able to comply with any recommended practices specified or referenced in this Manual, the SAR organisation shall notify the AAR Division of the non-compliance or deviation with the supporting reason including any safety assessment or other studies undertaken, and where appropriate, an indication of when compliance with the current recommended practices can be expected.
- 1.2.6 Any exemption or deviation granted to the SAR organisation shall also be recorded in the SAR operations manual. The SAR operations manual shall also contain the details of the exemption or deviation, such as the reason that the exemption or deviation was requested and any resultant limitations or conditions imposed.
- 1.2.7 In addition to the Manual of Standards, the following may also be issued as and when required to supplement the Manual of Standards:
- (a) Safety Directive – this is a mandatory requirement to be complied by the SAR organisation. It is published for purposes of immediate promulgation of local standards and recommended practices in response to, but not limited to, amendments to ICAO Annexes. The Safety Directives will be incorporated into subsequent amendments of the Manual of Standards.
 - (b) Safety Publication – this is published for purposes of promulgating supplementary guidance materials to the standards and recommended practices in the Manual of Standards. The publications are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means, of complying with the Manual of Standards. Safety Publications may explain certain regulatory requirements by providing interpretive and explanatory materials.
 - (c) Information Circular – this is published for purposes of bringing to the attention of the SAR organisation

educational materials related to aviation safety. The publications could be initiated as a result of ICAO State letters which do not require immediate changes to local regulations, new safety initiatives or international best practices as identified by the AAR Division. The SAR organisation is encouraged to review and adopt the material if practicable. Where appropriate, the material in the publications may be incorporated into subsequent amendments of the Manual of Standards.

Chapter 2 – ORGANISATION

2.1 Search and Rescue Services

- 2.1.1 The SAR organisation shall, individually or in cooperation with other States, arrange for the establishment and prompt provision of search and rescue services within Singapore SRR to ensure that assistance is rendered to persons in distress. Such services shall be provided on a 24-hour basis.
- 2.1.2 Those portions of the high seas or areas of undetermined sovereignty for which search and rescue services will be established shall be determined on the basis of regional air navigation agreements. The SAR organisation, having accepted the responsibility to provide search and rescue services in such areas, shall thereafter, individually or in cooperation with other States, arrange for the services to be established and provided in accordance with the provisions of this MOS-SAR.
- 2.1.3 Basic elements of search and rescue services shall include organised available resources, communication facilities and a workforce skilled in coordination and operational functions.
- 2.1.4 Search and rescue services shall establish processes to improve service provision, including the aspects of planning, domestic and international cooperative arrangements and training.
- 2.1.5 In providing assistance to aircraft in distress and to survivors of aircraft accidents, the SAR organisation shall do so regardless of the nationality or status of such persons or the circumstances in which such persons are found.
- 2.1.6 The SAR organisation having accepted responsibility to provide search and rescue services shall use search and rescue units and other available facilities to assist any aircraft or its occupants that are or appear to be in a state of emergency.
- 2.1.7 Where separate aeronautical and maritime rescue coordination centres serve the same area, the SAR organisation shall ensure the closest practicable coordination between the centres. The SAR organisation should facilitate consistency and cooperation between their aeronautical and maritime search and rescue services. Joint rescue coordination centres should be established to coordinate aeronautical and maritime search and rescue operations, where practical.

2.2 Search and Rescue Region

2.2.1 The search and rescue region shall coincide with the boundaries of the Singapore Flight Information Region (FIR) within which the SAR organisation will provide search and rescue services.

2.3 Rescue coordination centre

2.3.1 The SAR organisation shall establish a rescue coordination centre within the SRR. The rescue coordination centre shall be staffed 24 hours a day by trained personnel proficient in the use of the English language used for radiotelephony communications.

2.4 Search and rescue communications

2.4.1 The rescue coordination centre shall have means of rapid and reliable two-way communication with:

- (a) associated air traffic services units;
- (b) associated rescue subcentres;
- (c) appropriate direction-finding and position-fixing stations;
- (d) where appropriate, coastal radio stations capable of alerting and communicating with surface vessels in the region;
- (e) the headquarters of SAR units in the region;
- (f) all maritime rescue coordination centres in the region and aeronautical, maritime or joint rescue coordination centres in adjacent regions;
- (g) a designated meteorological office or meteorological watch office;
- (h) SAR units;
- (i) alerting posts; and
- (j) the Cospas-Sarsat Mission Control Centre servicing the search and rescue region.

2.5 Search and rescue units

2.5.1 The SAR organisation shall designate as search and rescue units elements of public or private services suitably located and equipped for search and rescue operations.

2.5.2 As parts of the search and rescue plan of operation, the SAR organisation shall designate elements of public or private services that do not qualify as SAR units but are nevertheless able to participate in search and rescue operations.

2.6 Search and rescue equipment

2.6.1 SAR units shall be provided with equipment for locating promptly, and for providing adequate assistance at, the scene of an accident.

2.6.2 Each SAR unit should have means of rapid and reliable two-way communication with other search and rescue facilities engaged in the same operation.

2.6.3 Each search and rescue aircraft shall be equipped to be able to communicate on the aeronautical distress and on-scene frequencies and on such other frequencies as may be prescribed.

2.6.4 Each search and rescue aircraft shall be equipped with a device for homing on distress frequencies.

2.6.5 Each search and rescue aircraft, when used for search and rescue over maritime areas, shall be equipped to be able to communicate with vessels.

2.6.6 Each search and rescue aircraft, when used for search and rescue over maritime areas shall carry a copy of the *International Code of Signals* to enable it to overcome language difficulties that may be experienced in communicating with ships.

2.6.7 Unless it is known that there is no need to provide supplies to survivors by air, at least one of the aircraft participating in a search and rescue operation should carry droppable survival equipment.

2.6.8 The SAR organisation should locate, at appropriate aerodromes, survival equipment suitably packed for dropping by aircraft.

2.7 Search and rescue manual

2.7.1 The SAR organisation shall develop and maintain a search and rescue operations manual. The operations manual shall serve to demonstrate how the SAR organisation will comply with the requirements set out in this Manual of Standards – Search and Rescue.

2.7.2 The contents of the operations manual shall include but not limited to the following:

- (a) the information required of the SAR organisation as mentioned in this Manual; and

- (b) a description of the SAR organisation that shows the role, responsibilities and job functions of the search and rescue personnel who are responsible for ensuring the compliance of the organisation with the requirements in sub-paragraph (a).

2.7.3 The SAR organisation shall:

- (a) keep the operations manual in a readily accessible form;
- (b) ensure that SAR personnel have ready access to the operations manual; and
- (c) amend the operations manual whenever necessary to keep its content up to date.

2.7.4 The SAR organisation shall submit a copy of the most current operations manual to AAR Division.

Chapter 3 – COOPERATION

3.1 Cooperation between States

- 3.1.1 The SAR organisation shall coordinate their search and rescue efforts with those of neighbouring States. They should, when necessary, coordinate their search and rescue operations with those of neighbouring States especially when these operations are proximate to adjacent search and rescue regions.
- 3.1.2 Subject to the SAR agreements that had been concluded between Civil Aviation Authority of Singapore and the SAR authorities or agencies of neighbouring States, the SAR organisation shall permit immediate entry into its territory of SAR units of other States for the purpose of searching for the site of aircraft accidents and rescuing survivors of such accidents.
- 3.1.3 SAR units entering the territory of neighbouring States for search and rescue purposes shall transmit a request, giving full details of the projected mission and the need for it, to the rescue coordination centre of the neighbouring State concerned or to such other authority as had been designated by the State.
- 3.1.4 Requests for the entry of aircraft, equipment and personnel from other States to engage in search for aircraft in distress or to rescue survivors of aircraft accidents should be transmitted to the RCC. The RCC shall:
- (a) immediately acknowledge the receipt of such a request, and
 - (b) as soon as possible, indicate the conditions, if any, under which the projected mission may be undertaken.
- 3.1.5 Instructions as to the control which will be exercised on entry of such aircraft and/or personnel shall be given by the RCC in accordance with the standing plan for the conduct of search and rescue in the area.
- 3.1.6 The SAR organisation shall:
- (a) request from other rescue coordination centres such assistance, including aircraft, vessels, persons or equipment, as may be needed;
 - (b) grant any necessary permission for the entry of such aircraft, vessels, persons or equipment into its territory; and

- (c) make the necessary arrangements with the appropriate customs, immigration or other authorities with a view to expediting such entry.

- 3.1.7 The SAR organisation shall provide, when requested, assistance to other rescue coordination centres, including assistance in the form of aircraft, vessels, persons or equipment.
- 3.1.8 The SAR organisation shall make arrangement for joint training exercises involving its SAR units, those of neighbouring States and operators, to promote search and rescue efficiency.
- 3.1.9 The SAR organisation should make arrangements for periodic liaison visits by personnel of its RCC to the centres of neighbouring States.

3.2 Cooperation with other services

- 3.2.1 The SAR organisation shall arrange for all aircraft, vessels and local services and facilities which do not form part of the SAR organization to cooperate fully with the latter in search and rescue and to extend any possible assistance to the survivors of aircraft accidents.
- 3.2.2 To provide for the most effective and efficient search and rescue services, the SAR organisation should maintain the closest practicable coordination between the relevant aeronautical and maritime authorities.
- 3.2.3 The SAR organisation shall ensure that their search and rescue services cooperate with those responsible for investigating accidents and with those responsible for the care of those who suffered from the accident. To facilitate accident investigation, rescue units should, when practicable, be accompanied by persons qualified in the conduct of aircraft accident investigations.
- 3.2.4 The SAR organisation shall designate a search and rescue point of contact for the receipt of Cospas-Sarsat distress data.

3.3 Dissemination of information

- 3.3.1 The SAR organisation shall publish and disseminate all information necessary for the entry of SAR units of other States into its territory or, alternatively, include this information in search and rescue service arrangements.
- 3.3.2 When such information could benefit the provision of search and rescue services, the SAR organisation should make available, through the RCC or other agencies, information regarding their SAR plans of operation.

- 3.3.3 The SAR organisation should, to the extent desirable and practicable, disseminate information to the general public and emergency response authorities regarding actions to be taken when there is reason to believe that an aircraft's emergency situation may become cause for public concern or require a general emergency response.

Chapter 4 – PREPARATORY MEASURES

4.1 Preparatory information

4.1.1 The RCC shall have readily available at all times up-to-date information concerning the following in respect of its search and rescue region:

- (a) SAR units and alerting posts;
- (b) air traffic services units;
- (c) means of communication that may be used in search and rescue operations;
- (d) addresses and telephone numbers of all operators, or their designated representatives, engaged in operations in the region; and
- (e) any other public and private resources including medical and transportation facilities that are likely to be useful in search and rescue.

4.1.2 In addition, the RCC should have readily available all other information of interest to search and rescue, including information regarding:

- (a) the locations, call signs, hours of watch, and frequencies of all radio stations likely to be employed in support of search and rescue operations;
- (b) the locations and hours of watch of services keeping radio watch, and the frequencies guarded;
- (c) locations where supplies of droppable emergency and survival equipment are stored; and
- (d) objects which it is known might be mistaken for unlocated or unreported wreckage, particularly if viewed from the air.

4.1.3 The RCC whose search and rescue region includes maritime areas should have ready access to information regarding the position, course and speed of ships within such areas that may be able to provide assistance to aircraft in distress and information on how to contact them.

4.1.4 The SAR organisation should, individually or in cooperation with other States, either establish ship reporting systems in cooperation with maritime authorities or arrange communication links with

Amver or regional ship reporting systems to facilitate search and rescue operations at sea.

Note.— Amver is a cooperative international ship reporting system with worldwide coverage that is available for interrogation by all rescue coordination centres. A number of States also operate regional ship reporting systems.

4.2 Plans of operation

- 4.2.1 The RCC shall prepare detailed plans of operation for the conduct of search and rescue operations within its search and rescue region.
- 4.2.2 SAR plans of operation should be developed jointly with representatives of the operators and other public or private services that may assist in providing search and rescue services or benefit from them, taking into account that the number of survivors could be large.
- 4.2.3 The plans of operation shall specify arrangements for the servicing and refuelling, to the extent possible, of aircraft, vessels and vehicles employed in search and rescue operations, including those made available by other States.
- 4.2.4 The SAR plans of operation shall contain details regarding actions to be taken by those persons engaged in search and rescue, including:
- (a) the manner in which search and rescue operations are to be conducted in the search and rescue region;
 - (b) the use of available communication systems and facilities;
 - (c) the actions to be taken jointly with other rescue coordination centres;
 - (d) the methods of alerting en-route aircraft and ships at sea;
 - (e) the duties and prerogatives of persons assigned to search and rescue;
 - (f) the possible redeployment of equipment that may be necessitated by meteorological or other conditions;
 - (g) the methods for obtaining essential information relevant to search and rescue operations, such as weather reports and forecasts, appropriate NOTAM, etc.;

- (h) the methods for obtaining, from other rescue coordination centres, such assistance, including aircraft, vessels, persons or equipment, as may be needed;
- (i) the methods for assisting distressed aircraft being compelled to ditch to rendezvous with surface craft;
- (j) the methods for assisting search and rescue or other aircraft to proceed to aircraft in distress; and
- (k) cooperative actions to be taken in conjunction with air traffic services units and other authorities concerned to assist aircraft known or believed to be subject to unlawful interference.

4.2.5 SAR plans of operation should be integrated with airport emergency plans to provide for rescue services in the vicinity of aerodromes including, for coastal aerodromes, areas of water.

4.3 Search and rescue units

4.3.1 Each SAR unit shall:

- (a) be cognizant of all parts of the plans of operation prescribed in Para 4.2 that are necessary for the effective conduct of its duties; and
- (b) keep the rescue coordination centre informed of its preparedness.

4.3.2 The SAR organisation shall:

- (a) maintain in readiness the required number of search and rescue facilities; and
- (b) maintain adequate supplies of rations, medical stores, signalling devices and other survival and rescue equipment.

4.4 Training and exercises

4.4.1 To achieve and maintain maximum efficiency in search and rescue, the SAR organisation shall provide for regular training of their search and rescue personnel and arrange appropriate search and rescue exercises.

4.4.2 Training in aeronautical SAR shall consist of theoretical and practical knowledge of aeronautical SAR operations. The following subject areas should be included to demonstrate a level of

knowledge appropriate to conduct aeronautical SAR operations in the RCC:

- a) General SAR procedures
 - ICAO Annex 12 and International provisions
 - SAR organisation
 - SAR resources
 - SAR communications
 - SAR operating procedures
 - RCCs and rescue subcentres
 - Meteorological information for SAR
 - Conduct of search and air search patterns
 - Rescue of survivors

- b) Aeronautical SAR procedures
 - Aeronautical SAR organisation
 - Aeronautical RCC administration
 - Basic navigation
 - Search areas (sea and land)
 - Search techniques (sea and land)
 - Plotting exercises

- c) SAR exercises (SAREX)
 - A paper SAREX to coordinate, direct and control aeronautical SAR operations under simulated SAR situations.

4.4.3 The SAR organisation shall ensure that SAR personnel maintain a basic level of competency in recurrent / refresher training that includes knowledge about updates in ICAO provisions and other provisions pertaining to SAR.

4.4.4 The SAR organisation shall maintain training records for their SAR personnel.

4.5 Wreckage

4.5.1 The SAR organisation should ensure that wreckage resulting from aircraft accidents within its SRR or, in the case of accidents on the high seas or in areas of undetermined sovereignty, within the SRR for which it is responsible, is removed, obliterated or charted following completion of the accident investigation, if its presence might constitute a hazard or confuse subsequent search and rescue operations.

Chapter 5 – Operating procedures

5.1 Information concerning emergencies

- 5.1.1 Any authority or any element of the SAR organization having reason to believe that an aircraft is in an emergency shall give immediately all available information to the RCC.
- 5.1.2 RCC shall, immediately upon receipt of information concerning aircraft in emergency, evaluate such information and assess the extent of the operation required.
- 5.1.3 When information concerning aircraft in emergency is received from other sources than air traffic services units, the RCC shall determine to which emergency phase the situation corresponds and shall apply the procedures applicable to that phase.

5.2 Procedures for rescue coordination centres during emergency phases

5.2.1 Uncertainty phase

Upon the occurrence of an uncertainty phase, the RCC shall cooperate to the utmost with air traffic services units and other appropriate agencies and services in order that incoming reports may be speedily evaluated.

5.2.2 Alert phase

Upon the occurrence of an alert phase the RCC shall immediately alert SAR units and initiate any necessary action.

5.2.3 Distress phase

Upon the occurrence of a distress phase, the rescue coordination centre shall:

- (a) immediately initiate action by SAR units in accordance with the appropriate plan of operation;
- (b) ascertain the position of the aircraft, estimate the degree of uncertainty of this position, and, on the basis of this information and the circumstances, determine the extent of the area to be searched;
- (c) notify the operator, where possible, and keep the operator informed of developments;
- (d) notify other RCCs, the help of which seems likely to be required, or which may be concerned in the operation;

- (e) notify the associated air traffic services unit, when the information on the emergency has been received from another source;
- (f) request at an early stage such aircraft, vessels, coastal stations and other services not specifically included in the appropriate plan of operation and able to assist to:
 - i. maintain a listening watch for transmissions from the aircraft in distress, survival radio equipment or an ELT;

Note.— The frequencies contained in the specifications for ELTs given in Annex 10, Volume III, are 121.5 MHz and 406 MHz.
 - ii. assist the aircraft in distress as far as practicable; and
 - iii. inform the rescue coordination centre of any developments;
- (g) from the information available, draw up a detailed plan of action for the conduct of the search and/or rescue operation required and communicate such plan for the guidance of the authorities immediately directing the conduct of such an operation;
- (h) amend as necessary, in the light of evolving circumstances, the detailed plan of action;
- (i) notify the appropriate accident investigation authorities; and
- (j) notify the State of Registry of the aircraft.

5.2.4 The order in which these actions are described shall be followed unless circumstances dictate otherwise.

5.2.5 Initiation of search and rescue action in respect of an aircraft whose position is unknown

In the event that an emergency phase is declared in respect of an aircraft whose position is unknown and may be in one of two or more search and rescue regions, the following shall apply:

- (a) When a rescue coordination centre is notified of the existence of an emergency phase and is unaware of other centres taking appropriate action, it shall assume responsibility for initiating suitable action in accordance

with Para 5.2 and confer with neighbouring rescue coordination centres with the objective of designating one rescue coordination centre to assume responsibility forthwith.

(b) Unless otherwise decided by common agreement of the RCCs concerned, the RCC to coordinate search and rescue action shall be the centre responsible for:

- the region in which the aircraft last reported its position; or
- the region to which the aircraft was proceeding when its last reported position was on the line separating two search and rescue regions; or
- the region to which the aircraft was destined when it was not equipped with suitable two-way radio communication or not under obligation to maintain radio communication; or
- the region in which the distress site is located as identified by the Cospas-Sarsat system.

(c) After declaration of the distress phase, the RCC with overall coordination responsibility shall inform all RCCs that may become involved in the operation of all the circumstances of the emergency and subsequent developments. Likewise, all rescue coordination centres becoming aware of any information pertaining to the emergency shall inform the rescue coordination centre that has overall responsibility.

5.2.6 Passing of information to aircraft in respect of which an emergency phase has been declared

5.2.7 Whenever applicable, the RCC responsible for SAR action shall forward to the air traffic services unit serving the flight information region in which the aircraft is operating, information of the SAR action initiated, in order that such information can be passed to the aircraft.

5.3 Procedures where responsibility for operations extends to two or more States

5.3.1 Where the conduct of operations over the entire SRR is the responsibility of more than one State, each involved State shall take

action in accordance with the relevant plan of operations when so requested by the RCC of the region.

5.4 Procedures for authorities in the field

5.4.1 The authorities immediately directing the conduct of operations or any part thereof shall:

- (a) give instructions to the units under their direction and inform the RCC of such instructions; and
- (b) keep the RCC informed of developments.

5.5 Procedures for rescue coordination centres — termination and suspension of operations

5.5.1 SAR operations shall continue, when practicable, until all survivors are delivered to a place of safety or until all reasonable hope of rescuing survivors has passed.

5.5.2 The responsible RCC shall normally be responsible for determining when to discontinue search and rescue operations.

5.5.3 When a SAR operation has been successful or when a RCC considers, or is informed, that an emergency no longer exists, the emergency phase shall be cancelled, the SAR operation shall be terminated and any authority, facility or service that has been activated or notified shall be promptly informed.

5.5.4 If a SAR operation becomes impracticable and the RCC concludes that there might still be survivors, the centre shall temporarily suspend on-scene activities pending further developments and shall promptly inform any authority, facility or service which has been activated or notified. Relevant information subsequently received shall be evaluated and SAR operations resumed when justified and practicable.

5.6 Procedures at the scene of an accident

5.6.1 When multiple facilities are engaged in SAR operations on-scene, the RCC shall designate one or more units on-scene to coordinate all actions to help ensure the safety and effectiveness of air and surface operations, taking into account facility capabilities and operational requirements.

- 5.6.2 When a pilot-in-command observes that either another aircraft or a surface craft is in distress, the pilot shall, if possible and unless considered unreasonable or unnecessary:
- (a) keep the craft in distress in sight until compelled to leave the scene or advised by the RCC that it is no longer necessary;
 - (b) determine the position of the craft in distress;
 - (c) as appropriate, report to the RCC or air traffic services unit as much of the following information as possible:
 - type of craft in distress, its identification and condition;
 - its position, expressed in geographical or grid coordinates or in distance and true bearing from a distinctive landmark or from a radio navigation aid;
 - time of observation expressed in hours and minutes Coordinated Universal Time (UTC);
 - number of persons observed;
 - whether persons have been seen to abandon the craft in distress;
 - on-scene weather conditions;
 - apparent physical condition of survivors;
 - apparent best ground access route to the distress site; and
 - (d) act as instructed by the RCC or the air traffic services unit.
- 5.6.3 If the first aircraft to reach the scene of an accident is not a SAR aircraft, it shall take charge of on-scene activities of all other aircraft subsequently arriving until the first SAR aircraft reaches the scene of the accident. If, in the meantime, such aircraft is unable to establish communication with the appropriate RCC or air traffic services unit, it shall, by mutual agreement, hand over to an aircraft capable of establishing and maintaining such communications until the arrival of the first SAR aircraft.
- 5.6.4 When it is necessary for an aircraft to convey information to survivors or surface rescue units, and two-way communication is not available, it shall, if practicable, drop communication equipment

that would enable direct contact to be established, or convey the information by dropping a hard copy message.

5.6.5 When a ground signal has been displayed, the aircraft shall indicate whether the signal has been understood or not by the means described in Para 5.6.4 or, if this is not practicable, by making the appropriate visual signal.

5.6.6 When it is necessary for an aircraft to direct a surface craft to the place where an aircraft or surface craft is in distress, the aircraft shall do so by transmitting precise instructions by any means at its disposal. If no radio communication can be established, the aircraft shall make the appropriate visual signal.

5.7 **Procedures for a pilot-in-command intercepting a distress transmission**

5.7.1 Whenever a distress transmission is intercepted by a pilot-in-command of an aircraft, the pilot shall, if feasible:

- (a) acknowledge the distress transmission;
- (b) record the position of the craft in distress if given;
- (c) take a bearing on the transmission;
- (d) inform the appropriate RCC or air traffic services unit of the distress transmission, giving all available information; and
- (e) at the pilot's discretion, while awaiting instructions, proceed to the position given in the transmission.

5.8 **Search and rescue signals**

5.8.1 The air-to-surface and surface-to-air visual signals in Appendix 1 shall, when used, have the meaning indicated therein. They shall be used only for the purpose indicated and no other signals likely to be confused with them shall be used.

5.8.2 Upon observing any of the signals in Appendix 1, aircraft shall take such action as may be required by the interpretation of the signal given in Appendix 1.

5.9 **Maintenance of records**

5.9.1 The RCC should keep a record of the operational efficiency of the SAR organisation in its region.

5.9.2 RCC should prepare appraisals of actual SAR operations in its region. These appraisals should comprise any pertinent remarks on

the procedures used and on the emergency and survival equipment, and any suggestions for improvement of those procedures and equipment. Those appraisals which are likely to be of interest to other States should be submitted to AAR Division for information and dissemination as appropriate.

APPENDIX 1 – Search and Rescue Signals

1.1 Signals with surface craft

1.1.1 The following manoeuvres performed in sequence by an aircraft mean that the aircraft wishes to direct a surface craft towards an aircraft or a surface craft in distress:

- (a) circling the surface craft at least once;
- (b) crossing the projected course of the surface craft close ahead at low altitude and:
 - i. rocking the wings; or
 - ii. opening and closing the throttle; or
 - iii. changing the propeller pitch.
- (c) heading in the direction in which the surface craft is to be directed.

Repetition of such manoeuvres has the same meaning.

1.1.2 The following manoeuvres by an aircraft means that the assistance of the surface craft to which the signal is directed is no longer required:

- crossing the wake of the surface craft close astern at a low altitude and:
- i. rocking the wings; or
 - ii. opening and closing the throttle; or
 - iii. changing the propeller pitch.

Note.— The following replies may be made by surface craft to the signal in 1.1.1:

— for acknowledging receipt of signals:

- i. the hoisting of the “code pennant” (vertical red and white stripes) close up (meaning understood);*
- ii. the flashing of a succession of “T’s” by signal lamp in the Morse code;*
- iii. the changing of heading to follow the aircraft.*

— for indicating inability to comply:



- i. the hoisting of the international flag “N” (a blue and white checkered square);
- ii. the flashing of a succession of “N’s” in the Morse code.

1.2 Ground-air visual signal code

1.2.1 Ground-air visual signal code for use by survivors

No	Message	Code Symbol
1	Require assistance	V
2	Require medical assistance	X
3	No or Negative	N
4	Yes or Affirmative	Y
5	Proceeding in this direction	↑

1.2.2 Ground-air visual signal code for use by rescue units

No	Message	Code Symbol
1	Operation completed	LLL
2	We have found all personnel	<u>LL</u>
3	We have found only some personnel	++
4	We are not able to continue, Returning to base	XX
5	Have divided into two groups. Each proceeding in direction indicated	
6	Information received that aircraft is in this direction	
7	Nothing found. Will continue to search	NN

1.2.3 Symbols shall be at least 2.5 metres (8 feet) long and shall be made as conspicuous as possible.

Note 1.— Symbols may be formed by any means such as: strips of fabric, parachute material, pieces of wood, stones or such like material; marking the surface by tramping, or staining with oil.

Note 2.— Attention to the above signals may be attracted by other means such as radio, flares, smoke and reflected light.

1.3. Air-to-ground signals

1.3.1 The following signals by aircraft mean that the ground signals have been understood:

(a) during the hours of daylight:

— by rocking the aircraft's wings;

(b) during the hours of darkness:

— flashing on and off twice the aircraft's landing lights or, if not so equipped, by switching on and off twice its navigation lights.

- 1.3.2 Lack of the above signal indicates that the ground signal is not understood.