



Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC176-01

Search and Rescue Standards –

Original

30 March 2025

GENERAL

Civil Aviation Safety Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes Explanatory Material (EM) where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with Civil Aviation Rule Part 176 – Search and Rescue Standards.

RELATED CAR

This AC relates specifically to Civil Aviation Rule 176.

CHANGE NOTICE

No change. This is the original AC.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation.

TABLE OF CONTENTS

| | |
|----------------------------------------------------------------------------------------|----|
| CHAPTER 1 - SEARCH AND RESCUE | 5 |
| 1.1 General..... | 5 |
| 1.2 SAR | 5 |
| 1.3 Classification of SAR services | 5 |
| 1.4 Delegation of CA Minister | 5 |
| 1.5 Applicability of Part 176 and AC as AMC | 5 |
| CHAPTER 2 - Organization | 5 |
| 2.1 Search and Rescue Services..... | 5 |
| 2.2 Search and Rescue Region (SRR) | 6 |
| 2.3 Rescue Coordination Center (RCC) and Rescue subcenters (RSC) | 6 |
| 2.4 Search and Rescue Communications | 6 |
| 2.5 Search and Rescue Units | 7 |
| 2.6 Search and Rescue Equipment | 7 |
| CHAPTER 3 - Cooperation | 7 |
| 3.1 Cooperation between States..... | 7 |
| 3.2 Cooperation with other services..... | 8 |
| 3.3 Dissemination of information..... | 8 |
| CHAPTER 4 - OPERATING PROCEDURES | 8 |
| 4.1 Information concerning emergencies | 8 |
| 4.2 Procedures for RCC during emergencies..... | 9 |
| 4.3 Procedures where responsibility for operations extends to two or more States | 10 |
| 4.4 Procedures for authorities in the field..... | 10 |
| 4.5 Procedures for RCC – termination and suspension of operations | 10 |
| 4.6 Procedures at the scene of an accident | 10 |
| 4.7 Search and rescue signals..... | 11 |
| CHAPTER 5 - PREPARATORY MEASURES | 14 |
| 5.1 Preparatory information | 14 |
| 5.2 Plans of operation..... | 14 |
| 5.3 Search and rescue units | 15 |
| 5.4 Wreckage | 15 |
| CHAPTER 6 - CONTINGENCY PLAN | 15 |
| CHAPTER 7 - OPERATIONS MANUAL | 15 |
| 7.1 The contents of the operations manual | 15 |
| 7.2 Requirements | 16 |
| CHAPTER 8 - PERSONNEL | 17 |
| 8.1 SAR Personnel Qualification..... | 17 |
| CHAPTER 9 - TRAINING AND EXERCISES | 18 |
| 9.1 Training and Exercise | 18 |

| | |
|-----------------------------------------------------|----|
| CHAPTER 10 - FACILITIES AND EQUIPMENT | 19 |
| 10.1 RCC Facilities | 19 |
| 10.2 Search and rescue equipment | 19 |
| CHAPTER 11 - HUMAN RESOURCE MANAGEMENT | 20 |
| 11.1 Requirements | 20 |
| CHAPTER 12 - MANAGEMENT SYSTEM | 21 |
| 12.2 SAR Management Review | 21 |
| 12.3 SAR Promotion | 21 |
| CHAPTER 13 - SECURITY PROGRAMME | 22 |
| 13.1 Security Program | 22 |
| CHAPTER 14 - DOCUMENTS AND RECORDS | 22 |
| 14.1 Documents and Records | 22 |
| 14.2 Document Control..... | 22 |
| 14.3 Maintenance of records | 23 |
| 14.4 Retention period | 23 |

GENERAL

Search and Rescue (SAR) services comprises of the search for and provision of aid to persons who are, or are believed to be in imminent danger of loss of life by an air accident. 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. The Search and Rescue service provider should develop and improve its SAR services, co-operate with neighboring States and to consider the SAR services to be part of a global system.

This advisory circular provides information to organisations or persons deleted by the Minister for Civil Aviation under s8B of the Civil Aviation Act 2000 (as amended) to perform or provide Search and Rescue Services (SAR) within Papua New Guinea(PNG) Search and Rescue Region (SRR).

PURPOSE

The purpose of this Advisory Circular (AC) is for the development of Search and Rescue (SAR) Standards to assist SAR service provider to comply with s8A and s8B of the Civil Aviation Act 2000 (as amended), CAR Part 176 and to meet the SAR obligations under the Convention on International Civil Aviation, Annex 12.

Additionally, this AC will provide guidelines and requirements for the establishment, maintenance and operation of search and rescue services within PNG SRR and to ensure regulatory oversight of the service provider when an Instrument of Delegation (IoD) is effected under s8B of the Civil Aviation Act 2000 (as amended).

CHAPTER 1 - SEARCH AND RESCUE

1.1 General

This chapter sets out Search and Rescue

1.2 SAR

- 1.2.1 Search and Rescue (SAR) is the search for and provision of lifesaving assistance to people in distress and imminent danger of loss of life.
- 1.2.2 Search and rescue services are defined as the performance of distress monitoring, communication and coordination.
- 1.2.3 SAR functions also includes provisions of medical advice, initial medical assistance, or medical evacuation, through the use of public and private resources, including cooperating aircraft, vessels and other target and installations.

1.3 Classification of SAR services

- 1.3.1 SAR is categorized into three services which are the provisions of coordination, search and rescue.
- 1.3.2 The rescue coordination center (RCC) is an operational facility responsible for promoting efficient organisation of SAR services and for coordinating the conduct of SAR operations. The RCC is the primary SAR facility that leads the coordination of all operational units (police, military, medical personnel etc)
- 1.3.3 Search is an operation normally coordinated by a rescue coordination centre or rescue subcenter using available personnel and facilities to locate persons in distress.
- 1.3.4 Rescue is an operation to retrieve persons in distress, provide for their initial medical or other needs, and deliver them to a place of safety.

1.4 Delegation of CA Minister

- 1.4.1 The Minister responsible for Civil Aviation under section 8B of the Civil Aviation Act 2000 (as amended) has the mandate to issue an instrument of delegation to any government agency whose functions are consistent with search and rescue to carry out the Minister's powers/functions under section 8A of the civil aviation act 2000 (as amended).

1.5 Applicability of Part 176 and AC as AMC

- 1.5.1 This Advisory Circular serves as an acceptable means of compliance to Civil Aviation Rule (CAR) Part 176 – Search and Rescue Standards.
- 1.5.2 This AC serves as a guideline for SAR Service provider for the performance of SAR services within PNG's Search and Rescue Region (SRR). Additionally, this AC will be used for regulatory oversight of the SAR service provider for continuous compliance with Annex 12 standards.

CHAPTER 2 - ORGANIZATION

This Chapter sets out the general provisions for Search and Rescue services.

2.1 Search and Rescue Services

- 2.1.1 The SAR service provider must, individually or in cooperation with other States, arrange for the establishment and prompt provision of search and rescue services within PNG's SRR to ensure that assistance is rendered to persons in distress. Such services must be provided on a 24-hour basis.
- 2.1.2 Those portions of the high seas or areas of undetermined sovereignty for which SAR services will be established must be determined on the basis of regional air navigation agreements. The SAR service provider, having accepted the responsibility to provide search and rescue services in such areas, must thereafter, individually or in cooperation with other States, arrange for the services to be established and provided in accordance with the provisions of this Advisory Circular.

- 2.1.3 Basic elements of search and rescue services must include a legal framework, a responsible authority, organized available resources, communication facilities and a workforce skilled in coordination and operational functions.
- 2.1.4 SAR services must 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 service provider must 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 service provider having accepted responsibility to provide SAR services must 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 centers (MRCCs) serve the same area, the SAR service provider must ensure the closest practicable coordination between the centers. The SAR service provider should facilitate consistency and cooperation between their aeronautical and maritime search and rescue services.

2.2 Search and Rescue Region (SRR)

- 2.2.1 The search and rescue region must coincide with the boundaries of the Port Moresby Flight Information Region (FIR) within which the SAR service provider will provide search and rescue services.

2.3 Rescue Coordination Center (RCC) and Rescue subcenters (RSC)

- 2.3.1 The SAR service provider must establish a rescue coordination center within the PNG's SRR.
- 2.3.2 The rescue coordination center and, as appropriate, rescue subcenter, must 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 RCC must have means of rapid and reliable two-way communication with:
- (1) associated air traffic services units;
 - (2) associated rescue subcenters;
 - (3) appropriate direction-finding and position-fixing stations;
 - (4) where appropriate, coastal radio stations capable of alerting and communicating with surface vessels in the region;
 - (5) the headquarters of SAR units in the region;
 - (6) all maritime rescue coordination centers (MRCC) in the region and aeronautical, maritime or joint rescue coordination centers in adjacent regions;
 - (7) a designated meteorological office or meteorological watch office;
 - (8) search and rescue units;
 - (9) alerting posts; and
 - (10) the Cospas-Sarsat Mission Control Center servicing the search and rescue region.
- 2.4.2 Each rescue subcenter must have means of rapid and reliable two-way communication with:
- (1) adjacent rescue subcenter
 - (2) a meteorological office or meteorological watch office
 - (3) search and rescue units
 - (4) alerting posts

2.5 Search and Rescue Units

- 2.5.1 The SAR service provider must designate as search and rescue units elements of public or private services suitably located and equipped for SAR operations.
- 2.5.2 As parts of the search and rescue plan of operation, the SAR service provider must designate elements of public or private services that do not qualify as SAR units but are nevertheless able to participate in SAR operations.

2.6 Search and Rescue Equipment

- 2.6.1 SAR units must be provided with equipment for locating promptly and for providing adequate assistance at, the scene of an accident.
- 2.6.2 Each SAR unit must have means of rapid and reliable two-way communication with other SAR facilities engaged in the same operations.
- 2.6.3 Each SAR aircraft must 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 SAR aircraft must be equipped with a device for homing on distress frequencies
- 2.6.5 Each SAR aircraft, when used for search and rescue over maritime areas, must be equipped to be able to communicate with vessels.
- 2.6.6 Each SAR aircraft, when used for search and rescue over maritime areas must carry a copy of the International Code of Signals to enable it to overcome, language difficulties that may be experienced in communication 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 SAR operation should carry droppable survival equipment.
- 2.6.8 The SAR service provider should locate, at appropriate aerodromes, survival equipment suitably packed for dropping by aircraft.

CHAPTER 3 - COOPERATION

This Chapter sets out the standards for Cooperation.

3.1 Cooperation between States

- 3.1.1 The SAR service provider must coordinate their search and rescue efforts with those of neighboring States. The SAR service provider, when necessary, coordinate their search and rescue operations with those of neighboring States especially when these operations are proximate to adjacent search and rescue regions.
- 3.1.2 The SAR service provider must, in so far as practicable, develop common search and rescue plans and procedures to facilitate coordination of SAR operations with those of neighbouring States.
- 3.1.3 Subject to the SAR Bilateral agreements that had been concluded between PNG and the SAR authorities or agencies of neighboring States, the SAR service provider must permit immediate entry into its territory the SAR units of other States for the purpose of searching for the site of aircraft accidents and rescuing survivors of such accidents.
- 3.1.4 SAR units entering the territory of neighboring 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 center of the neighboring State concerned or to such other authority as had been designated by the State.
- 3.1.5 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 must:
 - (1) immediately acknowledge the receipt of such a request, and
 - (2) as soon as possible, indicate the conditions, if any, under which the projected mission may be undertaken.
- 3.1.6 Subject to the SAR Bilateral agreements that had been concluded between PNG and the SAR authorities or agencies of neighboring States, the RCC shall:

- (1) request from other rescue coordination centers such assistance, including aircraft, vessels, persons or equipment, as may be needed;
 - (2) grant any necessary permission for the entry of such aircraft, vessels, persons or equipment into its territory; and
 - (3) make the necessary arrangements with the appropriate customs, immigration or other authorities with a view to expediting such entry.
- 3.1.7 The RCC must provide, when requested, assistance to other rescue coordination centers, including assistance in the form of aircraft, vessels, persons or equipment.
- 3.1.8 The SAR service provider must make arrangement for joint training exercises involving its SAR units, those of neighboring States and operators, to promote search and rescue efficiency.
- 3.1.9 The SAR service provider should make arrangements for periodic liaison visits by personnel of its RCC to the centres of neighboring States.

3.2 Cooperation with other services

- 3.2.1 The SAR service provider must arrange for all aircraft, vessels and local services and facilities which do not form part of the SAR service provider 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 service provider should maintain the closest practicable coordination between the relevant aeronautical and maritime authorities.
- 3.2.3 The SAR service provider must 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 service provider must designate a search and rescue point of contact for the receipt of Cospas-Sarsat distress data.
- 3.2.5 For SAR purposes, RCC must coordinate with ATS units for all information relevant to a state of emergency of an aircraft, including copies of journals, flight plans, audio tape records, recorded radar data plots and all other relevant document.

3.3 Dissemination of information

- 3.3.1 The SAR service provider must 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 service provider should make available, through the RCC or other agencies, information regarding their SAR plans of operation.
- 3.3.3 The SAR service provider 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 - OPERATING PROCEDURES

This Chapter sets out the standards for Operating Procedures.

4.1 Information concerning emergencies

- 4.1.1 Any authority or any element of the SAR service provider having reason to believe that an aircraft is in an emergency shall give immediately all available information to the RCC.
- 4.1.2 RCC shall, immediately upon receipt of information concerning aircraft in emergency, evaluate such information and assess the extent of the operation required.
- 4.1.3 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.

4.2 Procedures for RCC during emergencies

4.2.1 Uncertainty Phase

- (a) 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.

4.2.2 Alert Phase

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

4.2.3 Distress Phase

Upon the occurrence of a distress phase, the RCC 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 RCC 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.
- (k) The order in which these actions are described shall be followed unless circumstances dictate otherwise.

4.2.4 Initiation of SAR 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 center is notified of the existence of an emergency phase and is unaware of other centers taking appropriate action, it shall assume responsibility for initiating suitable action in accordance with Para 6.2 and confer with neighboring rescue coordination centers with the objective of designating one rescue coordination center 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 center responsible for:
 - (i) the region in which the aircraft last reported its position; or
 - (ii) the region to which the aircraft was proceeding when its last reported position was on the line separating two search and rescue regions; or

- (iii) 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
- (iv) 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 centers becoming aware of any information pertaining to the emergency shall inform the rescue coordination center that has overall responsibility.

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

(a) 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.

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

4.3.1 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.

4.4 Procedures for authorities in the field

4.4.1 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.

4.5 Procedures for RCC – termination and suspension of operations

4.5.1 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.

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

4.5.3 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.

4.5.4 If a SAR operation becomes impracticable and the RCC concludes that there might still be survivors, the center 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.

4.6 Procedures at the scene of an accident

4.6.1 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.

4.6.2 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:

- (i) type of craft in distress, its identification and condition;
- (ii) its position, expressed in geographical or grid coordinates or in distance and true bearing from a distinctive landmark or from a radio navigation aid;
- (iii) time of observation expressed in hours and minutes Coordinated Universal Time (UTC);
- (iv) number of persons observed;
- (v) whether persons have been seen to abandon the craft in distress;
- (vi) on-scene weather conditions;
- (vii) apparent physical condition of survivors;
- (viii) apparent best ground access route to the distress site; and
- (d) act as instructed by the RCC or the air traffic services unit.

4.6.3 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.

4.6.4 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.

4.6.5 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 4.7.4 or, if this is not practicable, by making the appropriate visual signal.

4.6.6 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.

4.7 Search and rescue signals

This chapter outlines SAR Signals.

4.7.1 Signals with surface craft

4.7.1.1 Personnel involved in SAR operations must be familiar with the types of signals they can expect to encounter in order to evaluate their meaning correctly and take appropriate action.

4.7.1.2 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 such precise instructions cannot be transmitted or when necessary for any other reason, the instructions shall be given by using the procedure prescribed herein.

4.7.1.3 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:
 - (1) rocking the wings; or
 - (2) opening and closing the throttle; or
 - (3) changing the propeller pitch.

Note. - Due to high noise level on board surface craft, the sound signals in (2) and (3) may be less effective than the visual signal in (1) and are regarded as alternative means of attracting attention.

- (c) heading in the direction in which the surface craft is to be directed. Repetition of such manoeuvres has the same meaning.

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

- (a) Crossing the wake of the surface craft close astern at a low altitude and:
- (1) rocking the wings; or
 - (2) opening and closing the throttle; or
 - (3) changing the propeller pitch.

Note. – The following replies may be made by surface craft to the signal in 4.7.1.3 for acknowledging receipt of signals:

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

for indicating inability to comply;



- (1) the hoisting of the international flag “N” (a blue and white checkered square); (2) the flashing of a succession of “N’s” in the Morse code.

4.7.2 Ground-air visual signal code

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 | ↑ |

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 |

Symbols must be at least 2.5 metres (8 feet) long and must 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.

4.7.3 Air-to-ground signals

4.7.3.1 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.

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

CHAPTER 5 - PREPARATORY MEASURES

This Chapter sets out the standards for Preparatory measures.

5.1 Preparatory information

- 5.1.1 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.
- 5.1.2 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.
- 5.1.3 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.
- 5.1.4 The SAR service provider 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 centers. A number of States also operate regional ship reporting systems.*

5.2 Plans of operation

- 5.2.1 The RCC shall prepare detailed plans of operation for the conduct of search and rescue operations within its search and rescue region.
- 5.2.2 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.
- 5.2.3 The plans of operation shall specify arrangements for the servicing and refueling, to the extent possible, of aircraft, vessels and vehicles employed in search and rescue operations, including those made available by other States.
- 5.2.4 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 centers;
 - (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 centers, 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.

5.2.5 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.

5.3 Search and rescue units

5.3.1 Each SAR unit shall:

- (a) be cognizant of all parts of the plans of operation prescribed in Para 13.3 that are necessary for the effective conduct of its duties; and
- (b) keep the rescue coordination center informed of its preparedness.

5.3.2 The SAR service provider shall:

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

5.4 Wreckage

5.4.1 The SAR service provider 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 6 - CONTINGENCY PLAN

- 6.1 The SAR service provider shall develop and put into effect the contingency plan that defines the planned actions to be taken for back-up RCC facility, or arrangement with another RCC as a contingency against inability to operate from the primary RCC due to the need to evacuate or loss of system.
- 6.2 The contingency arrangements should be tested periodically, but not less than once every six months.

CHAPTER 7 - OPERATIONS MANUAL

The SAR service provider shall develop and maintain a search and rescue operations manual. The operations manual shall serve to demonstrate how the SAR service provider will comply with the guidelines set out in this Advisory Circular

7.1 The contents of the operations manual

An operations manual shall contain at least the following information:

- (a) a table of contents based on the items in the manual, indicating the page number on which each item begins;
- (b) a description of the SAR service provider's organizational structure and a statement setting out the functions that the SAR service provider performs, or proposes to perform;

- (c) a description of the chain of command established, or proposed to be established, by the SAR service provider and a statement of the duties and responsibilities of any supervisory positions within the organizational structure;
- (d) a statement showing how the SAR service provider determines the number of operational staff required including the number of operational supervisory staff;
- (e) a statement showing name, location and contact number of RCC;
- (f) a list of the SAR facilities, location and contact detail of SAR unit;
- (g) a statement for each SAR unit, showing the hours of operation of the service;
- (h) a statement of the responsibilities and functions of each operating position;
- (i) a description of the arrangements made or proposed to be made by the SAR service provider to ensure that it has, and will continue to receive, on a daily basis, the information necessary for providing the service;
- (j) a description of the arrangements made or proposed to be made by the SAR service provider to ensure that it has, and will continue to be able to provide, information in connection with its search and rescue services to another person whose functions reasonably require that information;
- (k) a description of the SAR service provider's document and record keeping system;
- (l) a copy of any agreement entered into by the SAR service provider in relation to the provision of any of the search and rescue services;
- (m) a copy of the document that sets out the SAR service provider's safety management;
- (n) a description of the SAR service provider's quality assurance;
- (o) a copy of the SAR service provider's contingency plan;
- (p) a copy of the SAR service provider's data, personnel and physical security program;
- (q) a description of the processes, work flow and documentation used to present to staff the relevant standards, rules and procedures contained in ICAO Annexes 12, 13, ICAO IAMSAR Manual, ICAO Regional Supplementary Procedures and any of the SAR service provider's specific instructions for the provision of search and rescue services;
- (r) detailed plans of operation for the conduct of search and rescue operations within PNG's SRR subject to subsection/chapter 5.2;
- (s) a description of the processes and documentation used to provide operational instructions to staff;
- (u) a description of the procedures to be used in commissioning new facilities, equipment and services including decommissioning obsolete facilities, equipment and services;
- (v) the procedures to be followed for revising the operations manual;
- (w) a description of the procedures to be followed to ensure all operational staff are familiar with any operational changes that have been issued since they last performed operational duties.

7.2 Requirements

7.2.1 The SAR service provider 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.

7.2.2 The SAR service provider shall submit a copy of the most current operations manual to Air Navigation Services Standards Department.

CHAPTER 8 - PERSONNEL

The SAR service provider shall ensure that the SAR personnel have appropriate qualification, experience and training to perform their duties for providing each service in a safe, efficient, continuous and sustainable manner.

8.1 SAR Personnel Qualification

- 8.1.1 The SAR service provider shall establish appropriate minimum qualification and experience requirements for the SAR personnel.
- 8.1.2 The RCC shall be staffed 24 hours a day by trained personnel proficient in the use of the language used for radiotelephony communications.
- 8.1.3 RCC personnel involved in the conduct of radiotelephony communications shall be proficient in the use of the English language.
- 8.1.4 RCC personnel must be able to communicate with other RCCs, as well as ship masters and aircraft commanders, who are required to be able to speak English.
- 8.1.5 The RCC personnel should be fully qualified in SAR incident analysis, search planning and SAR operations management.

CHAPTER 9 - TRAINING AND EXERCISES

This Chapter sets out the standards for a Training and Exercise.

9.1 Training and Exercise

- 9.1.1 The SAR service provider shall establish the formal training program detailing the type of training to be provided for the technical personnel. The training program shall contain at least the following information,
- (a) initial training;
 - (b) specialize training;
 - (c) on-the-job (OJT) training;
 - (d) recurrent and refresher training;
 - (e) SAR exercise.
- 9.1.2 To achieve and maintain maximum efficiency in search and rescue, the SAR service provider shall provide for periodic training of their search and rescue personnel and arrange appropriate search and rescue exercises.
- 9.1.3 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 organization
 - SAR resources
 - SAR communications
 - SAR operating procedures
 - RCCs and rescue subcenters
 - Meteorological information for SAR
 - Conduct of search and air search patterns
 - Rescue of survivors
 - (b) Aeronautical SAR procedures
 - Aeronautical SAR organization
 - 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.
- 9.1.4 The SAR service provider 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.
- 9.1.5 The SAR service provider shall maintain training records for their SAR personnel.

CHAPTER 10 - FACILITIES AND EQUIPMENT

- (a) The SAR service provider shall provide adequate facilities and equipment including spare parts for providing each service in a safe, efficient, continuous and sustainable manner.
- (b) The SAR service provider should develop and maintain a current, comprehensive electronic list of 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 CASA PNG.

10.1 RCC Facilities

- 10.1.1 The SAR service provider should ensure that RCCs are of sufficient size with adequate provision for operational positions designed in accordance with human factors principles (such as human machine interface) for a major search involving civil and military assets where applicable, and facilities such as:
- (a) Workstations, telephones (with international access), plotting tables, wall notice/status boards, computer, and communications equipment and systems, briefing/debriefing areas room for storage including incident records and recorders, RCC staff break and rest facilities;
 - (b) computer resources which may provide support to RCCs with incident management, plotting, search planning, mapping, contact databases, web-based information, etc.;
 - (c) charts, electronic or paper, which:
 - (i) apply to SAR (aeronautical, nautical, topographic and hydrographic);
 - (ii) depict SRR, neighboring SRRs, FIR(s), SAR resources and made available for all relevant aeronautical and maritime RCCs, ATS units, aircraft operators; and
 - (iii) provide a means of plotting;
 - (d) ability to reliably receive and acknowledge distress alerts 24 hours a day;
 - (e) maritime broadcast facilities;
 - (f) a means of recording, playback and archiving of communications;
 - (g) shipping/vessel communications and maritime broadcast facilities such as Coast Radio Stations, RCC radio and satellite communications, marine radio networks;
 - (h) aircraft communications – via ATS units, aircraft operators, satellite communications or direct between RCC and aircraft;
 - (i) access to aircraft and ship tracking data, e.g. ADS-B, Automatic Identification System and Long Range Identification and Tracking of Ships (LRIT) allowing rapid identification of potential aircraft and vessels that may divert to assist;
 - (j) a means of obtaining meteorological information – forecast, present and historical data;
 - (k) if applicable drift modelling software;
 - (l) if applicable, ocean data including sea temperature, currents, winds, tides, etc.;
 - (m) if applicable, SAR Datum Buoys, preferably with satellite tracking capability;
 - (n) RCC documentation and reference material such as plans of operation, procedures manuals, guidance material, ICAO and IMO references, SAR agreements; and
 - (o) Cospas-Sarsat equipment and reference material.

10.2 Search and rescue equipment

- 10.2.1 SAR units shall be provided with equipment for locating promptly, and for providing adequate assistance at, the scene of an accident.
- 10.2.2 Each SAR unit should have means of rapid and reliable two-way communication with other search and rescue facilities engaged in the same operation.
- 10.2.3 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.
- 10.2.4 Each search and rescue aircraft shall be equipped with a device for homing on distress

frequencies.

- 10.2.5 Each search and rescue aircraft, when used for search and rescue over maritime areas, shall be equipped to be able to communicate with vessels.
- 10.2.6 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.
- 10.2.7 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.
- 10.2.8 The SAR service provider should locate, at appropriate aerodromes, survival equipment suitably packed for dropping by aircraft.

CHAPTER 11 - HUMAN RESOURCE MANAGEMENT

This chapter sets out the standards for human resources management to ensure that human resources are properly managed with the provision of SAR services.

11.1 Requirements

- 11.1.1 The SAR service provider shall systematically address human resources management in the following key aspects:
 - (a) management responsibilities and accountabilities;
 - (b) staff deployment;
 - (c) operational watch rostering; and
 - (d) operational support arrangements.
- 11.1.2 The SAR service provider shall document the structure and internal organization. This document shall identify the key personnel responsible for the safe conduct of the SAR services, in particular of the management of personnel in charge of safety, quality, security and human resources-related functions as applicable. Their positions, responsibilities, functions, accountabilities and authorities are to be clearly defined. The SAR service provider shall also develop job descriptions for SAR personnel. Organization chart indicating the specific responsibilities and accountabilities should be provided.
- 11.1.3 The SAR service provider shall document and define the method of determining staffing levels to ensure safe and efficient SAR operations.
- 11.1.4 The SAR service provider shall deploy sufficient number of staffs operated 24 hours a day by trained and qualified personnel.
- 11.1.5 The SAR service provider shall plan the level of staffing requirements taking into account the following factors:
 - (a) duty and workload required;
 - (b) training requirements;
 - (c) rest days or rest periods between shifts;
 - (d) leave requirements;
 - (e) sick leave reserve.
- 11.1.6 The SAR service provider should develop policies and procedures to enable recruitment and retention of adequate SAR personnel.

CHAPTER 12 - MANAGEMENT SYSTEM

This Chapter sets out the standards for Quality Assurance and Safety Management.

12.1 SAR Quality Assurance

12.1.1 The SAR service provider should implement SAR System Improvement and Assessment measures, including Safety Management and Quality Assurance systems, that:

- (a) provide 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 risk and corrective and preventive actions that prevent or minimize risk and the possibility of substandard SAR performance;
- (c) establishes an internal quality assurance program, which includes regular internal audits of the RCC, SAR operations, SAR facilities and procedures that are conducted by trained auditors; and
- (d) ensures the person responsible for internal quality assurance within the entity responsible for SAR services has direct access to report to the Head of the entity responsible for SAR services on matters of quality assurance.

12.2 SAR Management Review

12.2.1 The SAR Service provider should conduct an annual or more frequent analysis of their current national 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) be informed regarding the availability and capability of SAR services in neighboring States;
- (c) identify SAR research and development programs, especially those which could be 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;
 - (iv) time from first alert to tasking the SRU;
 - (iv) time from first alert to arrival on scene of first SRU; and
 - (v) time from first alert to rescue.
- (e) plan for any necessary improvements to gradually build and improve capability over time, which would be detailed in the National SAR Plan; and
- (f) regularly review and update SAR agreements as appropriate.

12.3 SAR Promotion

12.3.1 The SAR service provider should conduct SAR promotional programs (e.g. Seminars, Workshops and public safety campaigns) to:

- (a) encourage higher SAR preparedness by persons that may require SAR services through public safety campaigns aimed at preventing persons getting into distress situations (i.e.: 'preventative SAR');
- (b) ensure the support of government decision-makers for SAR facilities and improvements, in particular adequate funding availability;
- (c) assist media to understand SAR operations in order to minimize the need for explanations during SAR responses;
- (d) recognize improvement in national SAR systems;
- (e) enhance cooperation between SAR services and –
 - (i) civil, military and police agencies;

- (ii) ANSPs;
- (iii) aerodrome and port operators;
- (iv) aircraft and shipping operators;
- (v) meteorological agencies;
- (vi) accident investigation agencies;
- (vii) government and non-government agencies affected by SAR operations, in particular large scale national and international responses involving whole of government agencies; and other States.

CHAPTER 13 - SECURITY PROGRAMME

This Chapter sets out the standards for Security Program.

13.1 Security Program

13.1.1 The SAR service provider shall develop the security program cover the following information:

- (a) the procedure to be used for preventing and detecting intentional or unintentional damage to any system, equipment, software or data used for providing services;
- (b) the procedure to be used for responding to a threat of intentional damage to any system, equipment, software or data; and
- (c) the procedure to be used for preventing unauthorized people from having access to working space, working area, any system, equipment, software or data used by the SAR service provider in providing services.

CHAPTER 14 - DOCUMENTS AND RECORDS

This Chapter sets out the standards for Documents and Records.

14.1 Documents and Records

14.1.1 SAR service provider shall maintain all documents and records which are necessary for the operation of the service. These documents and records shall include but not limited to:

- (a) the Manual of Standards — Search and Rescue Services;
- (b) the SAR provider's operations manual;
- (c) the National SAR plan;
- (d) ICAO Annexes 12 and 13, Doc 9731 Volume I, II, III and other relevant ICAO documents;
- (e) records of facility and equipment;
- (f) documents related to audits conducted by the internal/external party;
- (g) records of job description, training and exercise program of each staff;
- (h) records of voice communication especially radio communications;
- (i) logs and diaries concerning SAR operation;
- (j) all records are legible for investigation and of a permanent nature.

14.2 Document Control

14.2.1 SAR service provider shall have in place document and data control processes that control the authorization, publication, distribution, and amendment of all documentation issued or required by SAR service provider.

14.2.2 These processes shall ensure that:

- (a) documents are authorized by the CASA PNG or a designated person;

- (b) the currency of document can be readily determined;
- (c) documents are available at locations where needed by SAR personnel;
- (d) only current versions of documents are available;
- (e) a master copy is securely held; and
- (f) all documents that are related to and referenced in the Operations Manual are indexed in the Operations Manual.

14.3 Maintenance of records

- 14.3.1 The RCC should keep a record of the operational efficiency of the SAR service provider in PNG's SRR.
- 14.3.2 The RCC should prepare appraisals of actual SAR operations in PNG's SRR. 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 Air Navigation Services Standards Department for information and dissemination as appropriate.

14.4 Retention period

- 14.4.1 Logs and diaries which contain SAR incident information shall be stored in permanent case folder.
- 14.4.2 The SAR service provider should keep the voice communication record at least 30 days except for investigation or judicial inquiry, the storage of record be not recycled until released by a higher authority.