



สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

Manual of Standards

Search and Rescue Services

CAAT-ANS-MOSSAR

Issue: 03

Revision: 00

Date: 11 OCT 2021

Approved By

A handwritten signature in blue ink, appearing to read "Suttipong Kongpool", is written over a horizontal line.

Suttipong Kongpool

Director General

The Civil Aviation Authority of Thailand

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Foreword

The Director General of The Civil Aviation Authority of Thailand is responsible under Section 15/17 (7) of the Air Navigation Act B.E. 2497 amended by the Air Navigation Act (No. 14) B.E. 2562 for issuing CAAT regulation on Air Navigation Services for Search and Rescue Services Standards to stipulate qualifications, rules, procedures, conditions, standards and practical guidance to ensure conformity with relevant International Standards.

The Manual of Standards (hereinafter 'MOS') is the means CAAT uses to meet its responsibilities under Section 15/17 (7) of the Air Navigation Act B.E. 2497 amended by the Air Navigation Act (No. 14) B.E. 2562, CAAT regulation No. 22 on Air Navigation Services for Search and Rescue Services Standards and CAAT rule on Manual of Standards - Search and Rescue Services for promulgating standards of Aeronautical Search and Rescue Services. The MOS prescribes the detailed technical provisions (aviation safety standards) that is determined to be necessary for the safety of air navigation.

The MOS is referenced in the particular regulation. You should refer to the applicable provisions of the Air Navigation Act B.E. 2497 amended by the Air Navigation Act (No. 14) B.E. 2562 and CAAT Regulation, Requirement and Rules together with this MOS, to ascertain the requirements of, and the obligations imposed by or under the civil aviation legislation.

Readers should forward advice of errors, inconsistencies or suggestions for improvement to this manual to the Manager, Air Navigation Services Standards Department (please see in subsection 1.1.8.3).

The MOS is issued and amended under the authority of the Director General of the Civil Aviation Authority of Thailand.



Suttipong Kongpool

Director General

The Civil Aviation Authority of Thailand

Record of Revision

Issue Number	Revision Number	Effective Date	Revised By	Section Affected
01	00	3 May 2019	ANS (SR)	Initial Issue
02	00	24 Feb 2020	ANS (SR)	Revise information as following sections; 1.1.4.1, 1.1.8.3, 1.1.9.1, 2.2, 5.2, 6.2, 8.2, 8.5.1, 8.5.2, 8.6, 10.2, 11.2.1
03	00	11 Oct 2021	ANS (SR)	Revise Effective date in accordance with the Regulation of the Civil Aviation Authority of Thailand No. 22 on Search and Rescue Services Standards and revise the information for correctness and completeness

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Chapter 1 Introduction

1.1 General

1.1.1 Aeronautical Search and Rescue (hereinafter ‘SAR’) comprises the search for, provision of aid to and relocation to a place of safety of persons who are, or are believed to be in distress. The two operations – search and rescue – may take many forms, depending on the nature of the distress, the context and available staff and facilities.

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

1.1.3 The SAR service provider should continually strive to develop and improve its SAR services, while cooperating with neighboring States and taking full account of its place in the global SAR system.

1.1.4 Document set

1.1.4.1 The document hierarchy consists of:

- a) the Air Navigation Act B.E. 2497 as amended by the Air Navigation Act (No. 14) B.E. 2562 (the Act) and the Civil Aviation Emergency Decree B.E. 2558 (the Decree)¹;
- b) the Civil Aviation Authority of Thailand Regulations, Requirements and Rules² (The CAAT Regulation, Requirement and Rules);
- c) the Manual of Standards (MOS); and
- d) Advisory Circulars (ACs).

1

- พระราชบัญญัติการเดินอากาศ พ.ศ. 2497 แก้ไขเพิ่มเติมโดย พระราชบัญญัติการเดินอากาศ (ฉบับที่ 14) พ.ศ. 2562

- พระราชกำหนดการบินพลเรือนแห่งประเทศไทย พ.ศ.2558

2

- ข้อบังคับสำนักงานการบินพลเรือนแห่งประเทศไทย ฉบับที่ 22 ว่าด้วยมาตรฐานการบริการการเดินอากาศ ด้านการค้นหาและช่วยเหลืออากาศยานประสบภัย

- ข้อกำหนดของสำนักงานการบินพลเรือนแห่งประเทศไทย ฉบับที่ 25 ว่าด้วยการขอและออกไปรับรองบริการการเดินอากาศ

- ประกาศสำนักงานการบินพลเรือนแห่งประเทศไทย เรื่อง การกำหนดประเภทนิติบุคคล อายุใบอนุญาต และหน้าที่อื่นของผู้ได้รับใบอนุญาตบริการการเดินอากาศ

- ระเบียบสำนักงานการบินพลเรือนแห่งประเทศไทย ว่าด้วยการจัดทำรายงานของผู้ได้รับใบอนุญาตบริการการเดินอากาศ

- ระเบียบสำนักงานการบินพลเรือนแห่งประเทศไทย ว่าด้วยคู่มือมาตรฐานการให้บริการการค้นหาและช่วยเหลืออากาศยานประสบภัย

- ระเบียบสำนักงานการบินพลเรือนแห่งประเทศไทย ว่าด้วยคู่มือการดำเนินงานด้านการค้นหาและช่วยเหลืออากาศยานประสบภัย

- 1.1.4.2 The Decree establishes and charges the Civil Aviation Authority of Thailand (CAAT) with functions relating to the assurance of safety in civil aviation and related purposes.
- 1.1.4.3 The CAAT regulations and requirements establish the regulatory framework within which all civil aviation service providers shall operate.
- 1.1.4.4 The MOS contains specific CAAT provisions comprising standards, procedures, and requirements intended to underwrite the provision of aeronautical search and rescue services within Bangkok SRR. The SAR service provider in Thailand is required to comply with the provisions contained in this MOS. To that ends, the SAR service provider shall document local procedures in its own operations manuals or national SAR plan/manual.
- 1.1.4.5 Readers should understand that in the circumstance of any perceived disparity or inconsistency between MOS and CAAT provisions, the primacy of intent rests with CAAT provisions.
- 1.1.4.6 The SAR service provider shall ensure that SAR services shall be in accordance with:
- a) the standards set out in the Manual of Standards (MOS);
 - b) the provisions set out or referred to in International Civil Aviation Organization (ICAO) Annex 12 and, ICAO Doc 9731 Volumes I, II and III as adapted in the Aeronautical Information Publication (AIP) - Thailand, parts General 1.7 and En-route.
 - c) any regional supplementary procedures set out in ICAO Doc 7030 related to SAR service.
- 1.1.4.7 Advisory Circulars (ACs) are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means of complying with the provisions. ACs may explain certain regulatory requirements by providing interpretive and explanatory materials. It is expected that service providers will document their own practices and procedures for meeting regulatory requirements in their own operational manuals or national SAR plan/manual.

- 1.1.4.8 Where the SAR service provider is unable to comply with any provision of this MOS, they shall inform CAAT in writing and within a reasonable period of time to explain the basis for its non-compliance and propose alternative procedures to ensure an equivalent level of safety. CAAT will review the SAR service provider's proposal in a timely fashion and, if giving approval, may impose such conditions as it deems appropriate. The SAR service provider shall acknowledge CAAT ruling, follow-up diligently and report within a reasonable period.
- 1.1.4.9 Where CAAT has approved a SAR service provider's proposal under subsection 1.1.4.8, the SAR service provider shall record the approved alternative procedure together with details of and rationale for the alternative procedures and any contingent conditions or limitations in the SAR service provider's operations manual.
- 1.1.5 Editorial Practices
- 1.1.5.1 To avoid any misunderstanding within the MOS, the word 'shall' is used to indicate compulsory compliance while 'should' is used to indicate that compliance is discretionary though strongly advisable.
- 1.1.6 Differences Between ICAO Standards and those in MOS
- 1.1.6.1 Notwithstanding the above, where there is a difference between a Standard prescribed in ICAO documents and the MOS, the MOS standard shall prevail.
- 1.1.7 Differences Published in AIP-Thailand
- 1.1.7.1 Differences from ICAO Standards, Recommended Practices and Procedures are published in AIP-Thailand GEN 1.7.
- 1.1.8 MOS Documentation Change Management
- 1.1.8.1 The Air Navigation Services Standards Department (ANS) has responsibility for the technical content of this MOS.
- 1.1.8.2 This MOS is issued and may only be amended under the authority of the Director General of CAAT.

1.1.8.3 Suggested changes to this MOS may be provided to the Manager of Air Navigation Services Standards Department of CAAT by:

Email: ans@caat.or.th

1.1.8.4 Requests for any change to the content of this MOS may come from:

- a) technical areas within CAAT; or
- b) aviation industry service providers or operators; or
- c) individuals or authorization holders.

1.1.8.5 The need to change standards in this MOS may arise for any of the following reasons:

- a) to strengthen or ensure safety;
- b) to ensure standardization;
- c) to respond to changed CAAT standards;
- d) to respond to ICAO prescription;
- e) to accommodate proposed initiatives or new technologies.

1.1.8.6 CAAT may approve trials of new procedures or technologies to develop appropriate standards.

1.1.9 Related document

1.1.9.1 These standards should be read in conjunction with:

- a) the Civil Aviation Authority of Thailand Regulations and Requirements;
- b) ICAO Annex 1 - Personnel Licensing
- c) ICAO Annex 10 - Aeronautical Telecommunications, Volume II - Communication Procedures including those with PANS status
- d) ICAO Annex 11 – Air Traffic Services;
- e) ICAO Annex 12 – Search and Rescue;
- f) ICAO Annex 13 – Aircraft Accident and Incident Investigation;
- g) ICAO Annex 14 - Aerodromes, Volume I - Aerodrome Design and Operations

- h) ICAO Annex 19 – Safety Management;
- i) ICAO International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual (Doc 9731) Volume I, Organization and Management;
- j) ICAO IAMSAR Manual (Doc 9731) Volume II, Mission Co-ordination;
- k) ICAO IAMSAR Manual (Doc 9731) Volume III, Mobile Facilities;
- l) ICAO Safety Management Manual (Doc 9859);
- m) ICAO Regional Supplementary Procedures (Doc 7030);
- n) AIP-Thailand.

1.2 Definitions and Abbreviations

1.2.1 Definitions

Unless otherwise stated, terms in this MOS-SAR have the meanings given in the AIP-Thailand or as follows:

Definition	Meaning
Aircraft operator	<p>“A person, organization or enterprise engaged in or offering to engage in an aircraft operation.” This means:</p> <ul style="list-style-type: none"> a) a person or company who, for compensation or hire, participates in the carriage by air transport of persons or property, or other aerial-work services using aircraft; commonly an “airline” or other type of air transport or services company; and b) a person who owns or shares ownership of a general aviation aircraft that is used by them but not for commercial air transport purposes.
Air traffic service	A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).
Air traffic services unit	A generic term meaning variously, air traffic control unit, flight information center or air traffic services reporting office.
Alerting post	Any facility intended to serve as an intermediary between a person reporting an emergency and a rescue coordination center or rescue subcenter.
Alert phase	A situation wherein apprehension exists as to the safety of an aircraft and its occupants.
Area control center (ACC)	An air traffic control facility primarily responsible for providing Air Traffic Control services to Instrument Flight Rules aircraft in controlled areas under its jurisdiction.
Automatic identification system	A system used by ships and vessel traffic services, principally for identifying and locating vessels.
Cospas-Sarsat System	A satellite system designed to detect and locate activated distress beacons transmitting in the frequency band of 406.0 - 406.1 MHz.

Definition	Meaning
Craft	Any air or sea-surface vehicle, or submersible of any kind or size.
Distress alert	The reporting of a distress incident to a unit which can provide or coordinate assistance.
Distress phase	A situation wherein there is 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 locator transmitter (ELT)	A generic term (related to aircraft) describing equipment which broadcasts distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated.
Emergency phase	A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.
Emergency position-indicating radio beacon (EPIRB)	A device, usually carried aboard maritime craft, that transmits a signal that alerts search and rescue authorities and enables rescue units to locate the scene of the distress.
Inmarsat	A system of geostationary satellites for worldwide mobile communications services, and which support the Global Maritime Distress and Safety System and other emergency communications systems.
Joint rescue coordination center (JRCC)	A rescue coordination center responsible for both aeronautical and maritime search and rescue operations.
Locating	The finding of ships, aircraft, units or persons in distress.
Long-range identification and tracking	A system which requires certain vessels to automatically transmit their identity, position and date/ time at six-hour intervals, in accordance with the International Convention for the Safety of Life at Sea (SOLAS) regulation V/19-1.

Definition	Meaning
Mass rescue operation (MRO)	Search and rescue services characterized by the need for immediate response to large numbers of persons in distress, such that the capabilities normally available to search and rescue authorities are inadequate.
Mission Control Center (MCC)	Part of the Cospas–Sarsat system that accepts alert messages from the local user terminal(s) and other mission control centers to distribute to the appropriate rescue coordination centers or other search and rescue points of contact.
On-scene coordinator (OSC)	A person designated to coordinate search and rescue operations within a specified area.
Operator	A person, organization or enterprise engaged in or offering to engage in an aircraft operation.
Personal locator beacon (PLB)	A portable device, manually activated, which transmits a distress signal on 406 MHz, and may have an additional homing signal on a separate frequency.
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.
Place of safety	A location where rescue operations are considered to terminate; where the survivors' safety of life is no longer threatened and where their basic human needs (such as food, shelter and medical needs) can be met; and, a place from which transportation arrangements can be made for the survivors' next or final destination. A place of safety may be on land, or it may be on board a rescue unit or other suitable vessel or facility at sea that can serve as a place of safety until the survivors are disembarked at their next destination.
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 center (RCC)	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 subcenter (RSC)	A unit subordinate to a rescue coordination center, established to complement the latter according to particular provisions of the responsible authorities.

Definition	Meaning
Search	An operation normally coordinated by a rescue coordination center or rescue subcenter 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 coordinator (SC)	One or more persons or agencies within an Administration with overall responsibility for establishing and providing SAR services and ensuring that planning for those services is properly coordinated.
Search and rescue facility	Any mobile resource, including designated search and rescue units, used to conduct search and rescue operations.
Search and rescue mission coordinator (SMC)	The official temporarily assigned to coordinate response to an actual or apparent distress situation.
Search and rescue occurrence	Any event associated with the policy, practices, procedures, training, coordination or conduct of SAR operations that could create a hazard to the safety of search and rescue operations or seriously compromise the provision of search and rescue services.
Search and rescue plan	A general term used to describe documents which exist at all levels of the national and international search and rescue structure to describe goals, arrangements and procedures which support the provision of search and rescue services.
Search and rescue point of contact (SPOC)	A point of contact for SAR, designated by the national administration, that is responsible for receiving distress alert information and providing the information to appropriate SAR authorities.
Search and rescue region (SRR)	An area of defined dimensions, associated with a rescue coordination center, within which search and rescue services are provided.
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.

Definition	Meaning
Search and rescue service provider	The provider of search and rescue services within the Bangkok search and rescue region.
Search and rescue sub-region (SRS)	A specified area within a search and rescue region associated with a rescue sub-center.
Search and rescue unit (SRU)	A unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue operations.
Ship reporting system	Reporting system which contributes to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment. This is established under the International Convention for the Safety of Life at Sea (SOLAS) regulation V/11 or, for SAR purposes, under chapter 5 of the International Convention on Maritime Search and Rescue, 1979.
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.
Vessel monitoring system	Systems primarily used by environmental, fisheries and regulatory organizations, but also used by other organizations, to monitor the position, time of the position provided, course and speed of vessels.
Vessel tracking	A generic term applied to all forms of vessel track data derived from multiple sources such as ship reporting systems, Automatic Identification System, Long-Range Identification and Tracking, Search and Rescue Aircraft, Vessel Monitoring System and Vessel Traffic Services.

1.2.2 Abbreviations

Unless otherwise stated, abbreviations in this MOS have the meanings given in the AIP-Thailand or as follows:

Abbreviations	Full Name
ACC	Area Control Center
ADS-B	Automatic Dependent Surveillance – Broadcast
AFN	Aeronautical Fixed Network
AFTN	Aeronautical Fixed Telecommunications Network
AIP	Aeronautical Information Publication

Abbreviations	Full Name
Amver	Automated Mutual-Assistance Vessel Rescue System
ARCC	Aeronautical Rescue Coordination Center
ASPOC	Administrative Single Point of Contact for Search and Rescue
ATC	Air Traffic Control
ATS	Air Traffic Services
CAAT	The Civil Aviation Authority of Thailand
COSPAS-SARSAT	Cosmicheskaya Sistema Poiska Avariynyh Sudov-Search and Rescue Satellite-Aided Tracking
ELT	Emergency Locator Transmitter
EPIRB	Emergency Position-Indicating Radio Beacon
FIR	Flight Information Region
IAMSAR	International Aeronautical and Maritime Search and Rescue
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
JRCC	Joint Rescue Coordination Center
kHz	kilohertz
MCC	Mission Control Center
MEOSAR	Medium-altitude Earth Orbit Search and Rescue
MHz	Megahertz
MOS	Manual of Standards
MOU	Memorandum of Understanding
MRCC	Maritime Rescue Coordination Center
MRO	Mass Rescue Operation
OSC	On-Scene Coordinator
PLB	Personal Locator Beacon
RCC	Rescue Coordination Center
RSC	Rescue Sub-center
SAR	Search and Rescue
SAREX	Search and Rescue Exercise
SC	Search and Rescue Coordinator

Abbreviations	Full Name
SMC	Search and Rescue Mission Coordinator
SPOC	SAR Point of Contact
SRR	Search and Rescue Region
SRS	Search and Rescue Sub-Region
SRU	Search and Rescue Unit
SWIM	System Wide Information Management
UTC	Coordinated Universal Time

Chapter 2 Operations Manual

2.1 General

The SAR service provider shall develop and maintain SAR operations manual and documents detailed provisions for all SAR related functions in national SAR plan or manual. The documents shall serve to demonstrate how the SAR service provider will comply with the requirements set out in this Manual of Standards – Search and Rescue Services.

2.2 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 text 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 SAR service provider; organizational structure;
- d) a statement detailing the number of operational and operational supervisory staff;
- e) a statement showing the name, location and contact number of the Rescue Coordination Center (RCC);
- f) a list of the facilities, equipment, location and contact details of Search and Rescue unit (SRU);
- g) a statement of each SRU, 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 is able to provide, information in connection with its SAR services to other entities whose functions reasonably require that information;
- k) a description of the SAR service provider's documents and record keeping system;
- l) a copy of any agreement entered into by the SAR service provider in relation to the provision of any SAR services;
- m) an elaboration of the SAR service provider's safety management;
- n) a description of the SAR service provider's quality assurance program;
- o) a copy of the SAR service provider's contingency plan;
- p) a copy of the SAR service provider's system, equipment, software, data and physical security program;
- q) a description of the processes and documentation used to inform and update staff in the relevant Standards, rules and procedures contained in ICAO Annexes 1, 10 Vol. II, 11, 12, 13, 14 and 19, ICAO IAMSAR Manual, ICAO Regional Supplementary Procedures and any of the SAR service provider's specific instructions for the provision of SAR services;
- r) detailed plans of operation for the conduct of SAR operations within Bangkok SRR in accordance with subsection 13.3;
- s) a description of the processes and documentation used to provide operational instructions to staff;
- t) a description of the SAR service provider's training and exercise schedule;

- 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.

2.3 Requirements

2.3.1 The SAR service provider shall:

- a) keep the operations manual in a readily accessible format;
- 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.

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

2.4 National SAR Plan

SAR plans describe how SAR services will be provided, organized and supported. SAR plans should be signed by all Government agencies which can provide or support SAR services. These agencies should all be represented on the National SAR Committee which oversees these plans. A SAR plan may be supported by legislation or regulations if necessary, or may be a self-supporting memorandum of understanding (MOU) between appropriate agencies. Ratification of an MOU at the Ministry level recognizes the importance of SAR, while allowing for an easier revision process than higher-level agreements would allow.

A national SAR plan is a single document that pertains to the SRRs, RCCs, and Rescue Sub-Centers (RSCs) and SAR-related functions for which one State is responsible. Principles of operational coordination must be covered in the plan,

which serves as a basis for more detailed provisions in subordinate State documents such as a national SAR manual or plans of operation.

2.4.1 The SAR service provider shall establish a single State SAR Plan that:

- a) designates the responsible RCC(s) , RSC(s) and 24-hour SAR Point of Contact/Administrative Single Point of Contact for SAR (SPOC/ASPOC);
- b) describes the relevant SRRs, inclusive of the limits for any SRSs (Search and Rescue Sub-Regions) (if any) created to make the organization more efficient, including the coordinates and geographical chart depiction of the SRR, SRSs and neighboring SRRs;
- c) details the National SAR Committee;
- d) details roles and responsibilities in three levels of coordination associated with SAR coordinators (SCs), SAR mission coordinators (SMCs), and on-scene coordinators (OSCs);
- e) details the governmental and non-governmental agencies with authority and responsibility for SAR coordination within Bangkok SRR, RCC may have dedicated civil, military and/ or other government SRU aircraft available as part of its national SAR plan;
- f) details roles and responsibilities of all agencies which will provide or support SAR services;
- g) details the criteria used for specific SAR facilities;
- h) details required and available SAR facilities, personnel, equipment and frequencies available for assignment as control, on-scene, monitoring homing, and public relations channels;
- i) details the SAR manuals, plans and procedures for national and regional cooperative SAR response arrangements;
- j) details integration of Mass Rescue Operations (MROs) with national disaster plan;

- k) details the budget issues to support commensurate with national goals;
- l) details the SAR personnel training and competency program, qualification standards, SAR certification if applicable and SAR cooperation training;
- m) details the SAR agreements required, including cooperation and coordination, setting forth the conditions for entry of each other's SRUs into their respective territories, the agreements should also provide for expediting entry of such units with the least possible formalities;
- n) is electronic and accessible on the Internet; and
- o) is monitored by quality assurance processes.

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Chapter 3 General Provisions for Search and Rescue Services

3.1 General

This Chapter sets out the general provisions for delivery of SAR services.

3.2 Organization

3.2.1 Search and rescue services

3.2.1.1 The SAR service provider shall, individually or in cooperation with other States or delegated by written agreement, arrange for the establishment and prompt provision of SAR services to ensure that assistance is rendered to persons in distress within the Bangkok SRR. Such services shall be provided on a 24-hour basis.

3.2.1.2 Responsibility for the provision of SAR services over the high seas and in areas of undetermined sovereignty are determined on the basis of regional air navigation agreements. Having accepted the responsibility to provide SAR services in such areas the nominated SAR provider shall, individually or in cooperation with other States, arrange for services to be provided in such areas in accordance with the provisions of this MOS-SAR.

Note: The phrase “regional air navigation agreements” refers to the agreements approved by the Council of ICAO normally on the advice of Regional Air Navigation Meetings.

3.2.1.3 Basic elements of SAR services shall include a legal framework, a responsible authority, organized available resources, communication facilities and a workforce skilled in coordination and operational functions.

3.2.1.4 SAR services shall establish processes to constantly improve service provision including aspects of planning, domestic and international cooperative arrangements, recruitment and training.

3.2.1.5 In providing assistance to aircraft in distress and survivors of aircraft accidents, the SAR service provider shall do so regardless of the nationality or status of persons or the circumstances in which such persons are found.

- 3.2.1.6 In accepting responsibility to provide SAR services, the SAR provider shall use nominated SRUs and other available facilities to assist any aircraft or its occupants that are or appear to be in a state of emergency.
- 3.2.1.7 Where established separately, the civil aviation SAR service provider shall ensure the closest practicable coordination with the maritime SAR service provider by extending utmost cooperation. Where practicable, establish the joint rescue coordination center (JRCC) to coordinate aeronautical and maritime SAR operations.
- 3.2.1.8 The SAR service provider shall empower SMCs with the authority to adequately carry out their responsibilities.

3.2.2 Search and rescue regions

- 3.2.2.1 The SAR service provider shall delineate the SRRs within which they will provide SAR services. Such regions shall not overlap and neighboring regions shall be contiguous.
- 3.2.2.2 SRRs are established to ensure the provision of adequate communication infrastructure, efficient distress alert routing and proper operational coordination to effectively support SAR services. SAR service providers may cooperate with the service providers of neighboring states to establish SAR services within a single SRR.
- 3.2.2.3 SAR service providers shall ensure that the delineation of SRR is determined on the basis of technical and operational considerations and is not related to the delineation of boundaries between States.
- 3.2.2.4 In so far as practicable, SRR should coincide with Bangkok Flight Information Region (FIR) within which the SAR service provider will provide SAR services, called Bangkok SRR, otherwise the agreement(s) and procedure(s) must be established.
- 3.2.2.5 The SAR service provider shall conduct studies to align, as far as practicable, aeronautical and maritime SRRs; and SRR and FIR.
- 3.2.2.6 Where applicable, the SAR service provider should establish additional oceanic SAR capability as far as practicable to ensure a timely and adequate SAR response is available to all oceanic areas of its SRR. This may be met through cooperative arrangements with neighboring States or other RCCs.

3.2.3 Rescue coordination centers and Rescue subcenters

- 3.2.3.1 The SAR service provider shall establish an RCC in each SRR.
- 3.2.3.2 The SAR service provider may establish an RCC with an associated SRR that, in accordance with regional air navigation agreement, extends over an area greater than the sovereign airspace of the Kingdom of Thailand.
- 3.2.3.3 In areas where public telecommunications facilities would not permit persons observing an aircraft in emergency to notify the RCC concerned directly and promptly, the SAR service providers shall designate suitable units of public or private services as alerting posts.

3.2.4 Search and rescue communications

- 3.2.4.1 The RCC shall have means of rapid and reliable two-way communication with:
- a) associated Air Traffic Services (ATS) units;
 - b) associated RSC;
 - c) appropriate direction-finding and position-fixing stations;
 - d) coastal radio stations capable of alerting and communicating with surface vessels in the region;
 - e) the headquarters and bases of SRUs in the region;
 - f) the Maritime Rescue Coordination Center (MRCC) in the region and all aeronautical, maritime and JRCCs in adjacent regions;
 - g) designated meteorological offices or meteorological watch offices;
 - h) SRUs;
 - i) alerting posts; and
 - j) the Cospas-Sarsat Mission Control Center (MCC) servicing the SRR.
- 3.2.4.2 Each RSC shall have means of rapid and reliable two-way communication with:
- a) associated RCC;
 - b) adjacent RSCs;
 - c) a meteorological office or meteorological watch office;
 - d) SRUs; and
 - e) alerting posts.

3.2.5 Search and rescue units

- 3.2.5.1 Elements of public or private services suitably located and equipped for SAR operations shall be designated as SRUs.
- 3.2.5.2 The SAR service provider must determine the minimum units and facilities necessary for provision of SAR operations within an SRR in accordance with regional air navigation agreements and as specified in the appropriate Air Navigation Plan and Facilities and Services Implementation Document publications.
- 3.2.5.3 Elements of public or private services that do not qualify as SRUs but may, nevertheless, be able to effectively participate in SAR operations, may be designated as parts of the SAR plan of operation for requisition by the SAR services provider for participation in SAR actions.

Chapter 4 Human Resources Management

4.1 General

This Chapter sets out standards for proper management of human resources throughout the provision of SAR services.

4.2 Requirements

4.2.1 The SAR service provider shall systematically address the following needs for effective human resources management:

- a) specification of responsibilities and accountabilities;
- b) staff deposition and deployment;
- c) operational watch rostering; and
- d) operational support arrangements.

4.2.2 The SAR service provider shall identify and document the structure of the particular personnel responsible for the safe, effective and efficient conduct of SAR services and, in particular, key officers to be responsible for safety, quality, security, and staff management. All established positions and respective responsibilities, authorities, functions and accountabilities shall be clearly defined.

4.2.3 The SAR service provider shall develop job descriptions for all operational and support personnel. An organization chart indicating specific responsibilities and accountabilities should be provided.

4.2.4 The SAR service provider shall define and document the method of determining staffing levels such as to provide safe and efficient SAR services.

4.2.5 The SAR service provider shall deploy a sufficient number of trained and qualified staff, skilled in coordination and operational function to provide SAR services throughout each 24 hour cycle.

4.2.6 In planning the proper level and competencies of staffing, the SAR services provider shall take into account the following factors:

- a) required duties and anticipated workload;
- b) training requirements;
- c) rest periods between shifts;
- d) recreation and sick leave requirements.

4.2.7 The SAR service provider shall develop policies and procedures to enable recruitment and retention of sufficient, competent SAR personnel.

Chapter 5 Personnel

5.1 General

The SAR service provider shall assign appropriately trained, qualified and experienced personnel to perform their respective duties in a safe, effective, efficient, and sustainable manner.

5.2 SAR personnel qualification

5.2.1 The SAR service provider shall establish appropriate minimum qualifications and experience requirements for SAR personnel.

5.2.2 Upon demonstrating the SAR service provider's requirements for qualification in training, exercises, examinations, experience and maturity, operational staff shall be issued certificates of competence to authorize their performance of duties in the RCC.

5.2.3 Certificates of competence shall be made in writing and be issued prior to the person assuming watchkeeping duties.

5.2.4 Complete and up-to-date records of certificates of competence shall be maintained in the RCC.

5.2.5 The RCC, as appropriate, RSC, shall be staffed throughout every 24 hour cycle by trained personnel proficient in the use of the language(s) used for radiotelephony communications. The RCC personnel shall be proficient in the use of the English language, ICAO Operational Level (Level 4) of the ICAO Language Proficiency Rating Scale, and have a working knowledge of word spelling in radiotelephony and ICAO standard phraseology.

5.2.6 RCC personnel should be qualified in SAR incident analysis, search planning and SAR operations management.

5.2.7 The SAR service provider shall provide a sufficient number of trained specialist RCC officers including SMCs and Assistant SMCs.

5.2.8 The SAR service provider should provide availability of a pool of RCC support staff who are familiar with RCC operations, but not trained as coordinators, that can assist with the functioning of the RCC during SAR incident response.

- 5.2.9 The SAR service provider should develop SAR personnel position descriptions that detail responsibilities and eligibility criteria for recruitment of operational staff.

Chapter 6 Training and Exercises

6.1 General

This Chapter sets out the standards for training and exercises.

6.2 Training and Exercises

6.2.1 The SAR service provider shall arrange for training and exercises for RCC and, as appropriate, RSC staff to develop and maintain their skills, knowledge and attitudes at a level necessary for safe and effective provision of civil aviation SAR services to domestic and international civil aviation operations. The training program, types of exercises and scheduled intervals shall be acceptable to CAAT.

6.2.2 The SAR service provider shall establish a mandatory training program suitable for all RCC personnel. The program shall include the following aspects:

- a) initial training;
- b) specialized training;
- c) on-the-job (OJT) training;
- d) recurrent and refresher training;
- e) SAR exercises (SAREXs).

6.2.3 To achieve and maintain maximum efficiency in SAR services, the SAR service provider shall provide for periodic training of SAR personnel, SRU staff, including military personnel and arrange regular SAREXs, which may be a desktop communications exercise, coordinating exercise, with each alternate SAREX being a full-scale exercise. The SAREX should also be fulfilled by participating in a sub-regional SAREX for testing the SAR system.

6.2.4 Training in aeronautical SAR shall consist of theoretical and practical aspects, as a minimum include:

To appropriate Levels:

- Air traffic control operations
- Aeronautical information services
- Aircraft accident and incident investigation
- Aircraft performance
- Airspace management
- Aviation law: Chicago Convention, Annexes 1, 11, 12, 19
- Aviation security
- Common English language and ICAO standard phraseology
- Maps and charts
- INMARSAT
- Meteorology
- Navigation including plotting exercises

<ul style="list-style-type: none"> - Aeronautical Fixed Network (AFN)/Aeronautical Fixed Telecommunication Network (AFTN) - Aeronautical drift - Bailout scenarios and planning - Briefing/debriefing SRUs - Briefing/questioning SRUs - Case studies - Coastal SAR planning - Computer applications - Cospas-Sarsat system - Datum determination - Datum marker buoys - Documentation of incidents - Emergency care - Environmental factors including knowledge of geography and facilities within the area of responsibility - Evaluation of flare sightings 	<ul style="list-style-type: none"> - Fatigue factors - International aspects - Interviewing techniques - Leeway drift - Look-out skills and limitations - Manoeuvring boards - Mass rescue operations - Media and family relations - Medical advice - Medical evacuations - Obtain and evaluate data - On-scene coordinator duties - Parachute drift - Plotting/resource allocation - Registration databases - Rescue procedures - Risk assessment - SAR agreements - SAR communications - SAR mission coordination - SAR operations conclusion 	<ul style="list-style-type: none"> - SAR phases, stages, and components - SAR resource capabilities - SAR suspension and termination procedures - SAR system organization - SAR technology - Search area calculations - Search patterns - Search planning - Ship reporting systems for SAR - SRU selection - Stress management - Survival equipment - Sweep width (electronic/visual) - Vessel tracking systems (Automatic Identification System, Long-Range Identification and Tracking of Ships, Vessel Monitoring System) - Water currents
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- 6.2.5 The SAR service provider shall ensure that recurrent and refresher training is provided to SAR personnel for maintaining a necessary level of competency that includes knowledge about updates in ICAO and other provisions pertaining to SAR.
- 6.2.6 The SAR service provider shall maintain complete training records for their SAR personnel in an orderly and updated manner.
- 6.2.7 The SAR service provider shall maintain the SAREX report, including exercise elements of planning, execution and evaluation.

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Chapter 7 Facilities and Equipment

7.1 General

7.1.1 The SAR service provider shall provide adequate facilities and equipment including spare parts for providing each aspect of service in a safe, effective, efficient, and sustainable manner.

7.1.2 The SAR service provider shall develop and maintain a comprehensive and up-to-date electronic list of SRUs, SAR Facilities and SAR Equipment including joint or shared facilities and equipment, and provide an Internet link to that list to CAAT and ICAO Asia/Pacific Regional Office.

7.2 RCC facilities

7.2.1 The RCC shall provide sufficient working space for operational positions designed in accordance with human factors principles (such as human-machine interface) and suitable for major search activity involving civil and military assets and facilities including:

- a) workstations, telephones (with international access), plotting tables, wall notice/status boards, computers, communications and recording equipment, briefing/debriefing areas, storage room for documents and records and rest facilities;
- b) purpose-built computer hard- and software able to support for RCC planning, mapping, calculating and data storage etc.;
- c) charts, electronic and/or paper, which:
 - i. provide coverage of the RCC's area of responsibility (aeronautical, nautical, topographic and hydrographic);
 - ii. depict the Bangkok SRR, neighboring SRRs, FIR(s), SAR resources and all relevant aeronautical and maritime RCCs, ATS units, aircraft operators; and
 - iii. are suitable for plotting;
- d) communications equipment, including ICAO's AFTN to reliably receive and transmit emergency messages H24 hours;

- e) maritime broadcast equipment;
- f) recorders with storage for playback and archiving communications;
- g) shipping/vessel communications equipment either for direct contact between RCC and ship/vessel or via maritime stations;
- h) aircraft communications equipment either for direct contact between RCC and aircraft or via ATS units and aircraft operators;
- i) aircraft and ship tracking data either from system or relevant sources, for monitoring, e.g. Automatic Dependent Surveillance-Broadcast (ADS-B), Automatic Identification System and Long-Range Identification and Tracking of Ships allowing rapid identification of potential aircraft and vessels that may divert to assist;
- j) a means of rapidly obtaining meteorological information – forecast, present and historical;
- k) drift modeling software or a means of rapidly accessing it;
- l) ocean data including sea temperature, currents, winds, tides or a means of rapidly accessing it;
- m) SAR Datum Buoys, preferably with satellite tracking capability or a means of rapidly accessing them;
- n) Cospas-Sarsat equipment and reference documents; and
- o) SWIM (System Wide Information Management)-enabled systems that can evolve the sharing of Flight Data, Aeronautical Information and meteorological data in alignment with contemporary practices being implemented under global and regional planning.

7.3 Search and rescue equipment

7.3.1 SRUs shall be provided with equipment for promptly locating and providing adequate assistance to survivors at the scene of an accident.

7.3.2 Each SRU shall have means of rapid and reliable two-way communication with ground stations and other SAR facilities engaged in the same operation.

- 7.3.3 Each SAR aircraft shall be equipped with suitable equipment to communicate on the aeronautical distress and on-scene frequencies and such other frequencies as may be prescribed for use in the area.
- 7.3.4 Each SAR aircraft shall be equipped with a device for homing on distress frequencies.
- 7.3.5 Each SAR aircraft, when used for SAR over maritime areas, shall be equipped with equipment that allows communication with vessels.
- 7.3.6 Each SAR aircraft, when used for SAR over maritime areas shall carry the International Code of Signals to overcome language difficulties that may be experienced in communicating with ships.
- 7.3.7 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.
- 7.3.8 The SAR service provider should locate or arrange to be located, at appropriate aerodromes, survival equipment suitably packed for dropping by aircraft.

7.4 Search and rescue frequencies

- 7.4.1 The SAR service provider shall arrange frequencies for SAR scene of action coordination purposes, the frequencies shall enable the communication between SRUs.
- 7.4.2 Where there is a requirement for the use of high frequencies for SAR scene of action coordination purposes, the frequencies 3023 kHz and 5680 kHz shall be employed.
- 7.4.3 Where specific frequencies are required for communication between RCCs and aircraft engaged in SAR operations, the SAR service provider should arrange the frequencies regionally from the appropriate aeronautical mobile frequency bands in light of the nature of the provisions made for the establishment of SAR aircraft.

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Chapter 8 Management System

8.1 General

This Chapter sets out the standards for safety management and quality assurance.

8.2 Safety Management

The SAR service provider shall implement a safety management acceptable to CAAT and which, as a minimum:

- a) sets out safety policy, objectives and safety accountabilities including the appointment of a safety manager within the organization;
- b) provides safety performance indicators including post-incident/ accident lessons learned, management reviews (through an RCC and SAR System continuous improvement process) and feedback from RCC staff, SAR system users and SAR stakeholders;
- c) identifies safety hazards;
- d) promotes the implementation of remedial action necessary to maintain agreed safety performance;
- e) provides for continuous monitoring and regular assessment of the safety performance; and
- f) is subject to regular review which has as its objective the improvement in the overall performance of safety management.

Note: Reference may be made to ICAO Safety Management Manual Doc 9859 for additional guidance where appropriate.

8.3 SAR Promotion

8.3.1 The SAR service provider should conduct SAR promotional programs (e.g. seminars, workshops and public safety campaigns) to:

- a) improve the emergency preparedness of persons who may require SAR services and minimize the likelihood of persons actually requiring SAR response;
- b) encourage the support for SAR facilities and improvement by government decision-makers and, particularly, the need for adequate funding;

- c) assist media to understand the need for and conduct of SAR operations;
- d) recognize the need for improvement in national SAR systems;
- e) enhance cooperation between the SAR service provider and:
 - i. civil, military and police agencies;
 - ii. Air Navigation Service Providers;
 - iii. aerodrome and port operators;
 - iv. aircraft and shipping operators;
 - v. meteorological agencies;
 - vi. accident investigation agencies;
 - vii. government and non-government agencies, domestic and international, involved in the provision of SAR services; and
 - viii. other States

8.4 SAR Management Review

The SAR Service provider should conduct an annual or more frequent analysis of its national SAR system to identify specific gaps in capability against the minimum requirements of ICAO Annex 12 and the guidelines of the IAMSAR Manual to:

- a) enable the ICAO Asia/ Pacific SAR data to be updated to more accurately reflect the Thailand's capability;
- b) enhance its understanding of the availability and capability of SAR services in neighboring States;
- c) identify SAR research and development programs, especially those which it could cooperate with other States;
- d) establish and maintain a database of basic SAR system statistics, which could include:
 - i. the number of annual SAR incidents, identify the type (e.g.: Cospas-Sarsat alert, ATS alerts, etc.) and outcome of SAR incidents;

- ii. the number of lives at risk and the number of lives saved;
 - iii. the time lapse from first alert to the tasking SRU(s);
 - iv. the time from first alert to arrival on scene of the first SRU; and
 - v. the time from first alert to rescue.
- e) plan for improvements in capability over time and their inclusion in the National SAR Plan; and
- f) regularly review and update SAR agreements as appropriate.

8.5 Reporting System

8.5.1 The SAR service provider shall establish a reporting system of significant safety occurrences and document those that occur during the conduct of SAR operations.

8.5.2 The SAR service provider shall notify any such occurrences to CAAT within three days of their occurrence together with an explanation of the event and any relevant recommendations for their ongoing mitigation.

8.6 SAR Quality Assurance

The SAR service provider shall implement a system of SAR services assessment and improvement including matters of Quality Assurance, that:

- a) improves timeliness of alerting, planning transit, location and rescue, etc. Timeliness shall be measured against the benchmarks of initial action beginning within five minutes of the notification of distress and rescue being effected within two hours;
- b) maintains an internal quality assurance program that includes regular internal audits of RCC management and training, SAR operations, SAR facilities and procedures;
- c) requires the trained and qualified internal auditors responsible for SAR quality assurance to report to the Head of the entity responsible for SAR services on matters of quality assurance; and
- d) enables ready feedback from RCC staff, SAR service beneficiaries and SAR stakeholders.

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Chapter 9 Contingency Plans

9.1 General

This Chapter sets out the standards for the contingency plans.

9.2 Contingency Plans

- 9.2.1 The SAR service provider shall develop and put into effect a contingency plan that defines actions to be taken for back-up of the RCC facility, or makes provision for temporary delegation of the SAR responsibility to, another appropriate national body or another RCC to assume its functions and responsibilities in the event of its planned or actual interruption to services.
- 9.2.2 The contingency arrangements should be tested periodically and not less than once every six months.

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Chapter 10 Security Program

10.1 General

This Chapter sets out the standards for the security program.

10.2 Security Program

10.2.1 The SAR service provider shall develop a security program that specifies:

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

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Chapter 11 Documents and Records

11.1 General

This Chapter sets out the standards for development, maintenance and storage of documents and records.

11.2 Documents and Records

11.2.1 The SAR service provider shall establish and maintain a library that contains up-to-date editions of relevant records, documents, directives, manuals and periodicals. All such documents, publications and records shall be made immediately accessible to operational and management staff at all times. The library shall include but not be limited to:

- a) the Manual of Standards — Search and Rescue Services;
- b) the SAR service provider's operations manual;
- c) the National SAR Plan;
- d) plans of operation;
- e) ICAO Annexes 11, 12, 13, 14 and 19;
- f) ICAO Doc 9731 Volumes I, II, III and other relevant ICAO documents;
- g) Handbook on Distress Alert Messages for RCCs, Search and Rescue Points of Contact (SPOCs), IMO Ship Security Competent Authorities;
- h) International Code of Signals;
- i) user manuals and service records of facilities and equipment;
- j) reports of audits conducted by any internal or external party;
- k) job descriptions and the training and exercise program for each staff;
- l) records of voice communications including radio communications;
- m) logs and diaries relevant to SAR operation;
- n) all legible records made during SAR actions and all documents of a permanent nature;

- o) SAR agreements;
 - p) International Convention on Maritime SAR (SAR Convention);
 - q) Asia/Pacific SAR Plan/electronic Air Navigation Plan;
 - r) relevant regional, national and agency SAR documents; and
 - s) any other managerial, operational or technical documentation relevant to the effective delivery of SAR services in Thailand.
- 11.2.2 The SAR service provider should establish a web-based SAR Library, or cooperate by contributing to an Internet-based Asia/Pacific resource.

11.3 Document Control

- 11.3.1 The SAR service provider shall establish document and data processes that control the authorization, publication, distribution, and amendment of all documentations issued or retained for the safe, effective and timely provision of civil aviation SAR services in Thailand.
- 11.3.2 These processes shall provide for:
- a) all service documents being authorized by CAAT or a designated person;
 - b) the currency of such documents being readily determined;
 - c) the documents being readily available at locations where needed by SAR personnel;
 - d) only current versions of the documents being available;
 - e) a master copy is securely held in workplace; and
 - f) all documents that are related to and referenced in the Operations Manual are indexed in the Operations Manual.
- 11.3.3 Documents may be held as computer-based records provided that where paper copies of such computer-based records being made subject to the same controls of para 11.3.2.
- 11.3.4 The SAR service provider shall make available for inspection by CAAT all documents, records, copies and extracts upon request.

11.4 Maintenance of records

- 11.4.1 The RCC should keep a record of all reports, assessments and comments on the operational effectiveness, efficiency and safety and timeliness of SAR actions coordinated by the Bangkok RCC.
- 11.4.2 RCC appraisals of SAR actions should pay regard to the implementation of all operational procedures and, particularly, all aspects of communication, coordination, cooperation and timeliness, any hazards and risks encountered, the suitability and serviceability of emergency and survival equipment, and , as appropriate, include suggestions for improvement to procedures and equipment. Those appraisals which are likely to be of interest to other States should be submitted to the Air Navigation Services Standards Department for information and dissemination as appropriate.

11.5 Retention period

- 11.5.1 Logs, diaries and documents which contain SAR accident/incident information shall be permanently stored electronically or in a case folder.
- 11.5.2 The SAR service provider shall keep the voice communication records for at least 30 days unless such records are required for upcoming formal investigation or judicial enquiries in which case they shall be retained until cleared for release by a higher authority.

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Chapter 12 Cooperation

12.1 General

This Chapter sets out the standards for cooperation.

12.2 Cooperation between States

12.2.1 The SAR service provider shall coordinate its SAR operations with those of neighboring States unless such operations are conducted proximate to adjacent SRRs in which case they should keep the neighboring State(s) fully informed.

12.2.2 SAR service providers should, in so far as practicable, develop common SAR plans and procedures to facilitate coordination of SAR operations with those of neighboring States.

12.2.3 The SAR service provider shall permit immediate entry into its territory of SRUs and facilities of other States for the purpose of searching for the location of aircraft accidents and rescuing survivors of such accidents.

12.2.4 When, in keeping with SAR agreements, Thailand SRUs and facilities are required to enter the territory of neighboring States for the purposes of SAR, the Bangkok RCC shall transmit a request, giving full details of the projected mission and the need for it, to the RCC of the neighboring State concerned or to such other authority as designated by the State.

12.2.5 Requests from other States for the entry of their aircraft, equipment and personnel into Thailand territory should be transmitted to the RCC for consideration.

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.

12.2.6 The SAR service provider shall ensure arrangements are established such that the Bangkok RCC considers a need for SRUs, facilities, persons or equipment to enter Thailand territory from neighboring States to assist in the conduct of SAR, the RCC shall:

- a) request from the RCCs of those neighboring States 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 to expedite such entry.

12.2.7 Whenever requested, the Bangkok RCC shall seek to cooperate with other RCCs in the rapid provision of assistance in the form of aircraft, vessels, persons or equipment.

12.2.8 The SAR service provider shall seek to arrange joint inter-State training exercises involving its SAR facilities and those of neighboring States and operators, to promote SAR capacity and efficiency.

12.2.9 The SAR service provider should seek to arrange for periodic liaison visits by personnel of its RCC and RSC to RCCs of neighboring States, relevant Air Traffic Control (ATC) units and airline operating centers in order to understand those organizations, facilities and capabilities.

12.2.10 The SAR service provider shall establish SAR agreements with States having adjoining SRRs or FIRs, including trans-regional neighbors (the agreements should include clear responsibilities for overlapping or non-adjointing aeronautical and maritime SRRs).

12.2.11 The SAR service provider shall provide up to date cross-border information on SAR capability (this should be included in bilateral SAR agreements).

12.2.12 The SAR service provider shall pre-arrange procedures for cross-border SAR responses (this should be included in bilateral SAR agreements).

12.3 Cooperation with other services

12.3.1 The SAR service provider shall seek to arrange for all aircraft, vessels and local services and facilities which do not form part of the SAR service to fully cooperate in SAR operations.

- 12.3.2 To provide for the most effective and efficient SAR services across land and sea, the SAR service provider shall maintain the closest practicable cooperation and coordination with all relevant aeronautical and maritime authorities.
- 12.3.3 The SAR service provider shall ensure extend the closest cooperation and coordination with those authorities responsible for accident investigation and the care of accident survivors.
- 12.3.4 Upon the request of accident investigation authorities and to facilitate their investigation, provision should be made, when practicable, for rescue units to be accompanied by such qualified persons.
- 12.3.5 The SAR service provider shall establish an ASPOCS for non-urgent, administrative matters, such details to be submitted to the ICAO Regional Office.
- 12.3.6 The SAR service provider shall designate, publish and ensure H24 monitoring of a SPOC for the receipt of Cospas-Sarsat distress data.
- 12.3.7 Whenever considered supportive of SAR operations, the Bangkok RCC shall coordinate with operators, briefing offices and ATS units in accumulating all information relevant to an aircraft emergency including copies of manifests, flight plans, audio tape records, recorded radar data plots and all other relevant document.
- 12.3.8 The SAR service provider shall conduct studies to check the feasibility for, and develop an implementation plan if practicable, the integration of aviation and maritime SAR activities, and as far as practicable, civil and military activities, including joint training and familiarization of staff and review of documentation to ensure harmonization of procedures, and joint exercises.
- 12.3.9 The SAR service shall ensure the cooperation with Area Control Center (ACC) to receive SAR alerts and information to RCC in timely manner.
- 12.3.10 The SAR service provider shall establish SAR Operations Plans between the State's SAR Authorities and Government, Military and Commercial operators including those with an over-water rotary wing or sea plane capability to include:

- a) procedures for cooperation and deployment of foreign SRUs;
- b) provision for translators/liaison officers/embassy officers for the daily tasking of the SRUs at the RCC;
- c) provision of information for logistic and administrative support (hotels, fuel, security passes, food, medicine, etc.);
- d) instructions on communication (operations normal reports, sightings, etc.) for search planning, command and control to foreign SRUs;
- e) planning and arrangements that ensure the availability of State and other SRU assets, especially over-water rotary wing capability where applicable, to support a timely and effective SAR response;
- f) daily end of day report by SRUs to the RCC (via mobile, email, fax, etc.).

12.4 Dissemination of information

12.4.1 The SAR service provider shall publish and disseminate all information necessary for the entry of SRUs of other States into its territory or, alternatively, include this information in SAR service arrangements.

12.4.2 When such information could benefit the provision of SAR services by other providers, the SAR service provider should make available, through the RCC or other agencies, information regarding their SAR plans of operation.

12.4.3 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.

12.4.4 The SAR service provider shall ensure the:

- a) establishment of a centralized information source publishing AIP-Thailand information:
 - i. the agency responsible for providing SAR services;
 - ii. the area of SAR responsibility where SAR services are provided;

- iii. the type of SAR services and facilities provided including indications where SAR aerial coverage is dependent upon significant deployment of aircraft;
 - iv. SAR agreements;
 - v. the conditions of SAR facility and service availability; and
 - vi. SAR procedures and signals used;
- b) establishment of an Internet-based SAR information sharing system (with security protocols as required and in accordance with the emerging System Wide Information Management - SWIM concept as applicable) to share SAR activity with States and key stakeholders participating in a SAR activity (the information sharing system should include a means of handling media and next of kin enquiries, and recognize the need to avoid premature media statements); and
- c) maximum practicable cooperation between State entities in the provision of accurate and timely information when required, including from military sources except where national security could be adversely affected.

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Chapter 13 Preparatory Measures

13.1 General

This Chapter sets out the standards for preparatory measures.

13.2 Preparatory information

13.2.1 The RCC shall have readily available at all times up-to-date information concerning the following in respect of its SRR:

- a) SRUs, RSCs and alerting posts;
- b) ATS units;
- c) means of communication that may be used in SAR 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 SAR.

13.2.2 In addition, the RCC should have readily available all other information of interest to SAR, including information regarding:

- a) the locations, call signs, hours of watch, and frequencies of all radio stations likely to be employed in support of SAR 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 might be mistaken for unlocated or unreported wreckage, particularly if viewed from the air.

13.2.3 The RCC should have ready access to information regarding the position, course and speed of ships within maritime areas of the SRR that may be able to provide assistance to aircraft in distress and information on how to contact them.

13.2.4 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 Automated Mutual-Assistance Vessel Rescue System (Amver) or regional ship reporting systems to facilitate SAR operations at sea.

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

13.2.5 The SAR service provider shall establish SAR Alerting procedures which:

- a) are tested and fully integrated with RCC procedures so that RCCs are rapidly notified of any SAR event 24 hours a day;
- b) include procedures for joint aeronautical and maritime distress alert notification, including reliable delivery and acknowledgement of Cospas-Sarsat distress alerts, support and response to both aviation and maritime SAR incidents; and
- c) where applicable, include protocols for civil and military support and sharing information.

13.3 Plans of operation

13.3.1 The RCC shall prepare detailed plans of operation for the conduct of SAR operations within its SRR.

13.3.2 SAR plans of operation should be developed jointly with representatives of the operators and other public or private services that may assist in providing SAR services or benefit from them, taking into account that the number of survivors could be large.

- 13.3.3 The plans of operation shall specify arrangements for the servicing and refueling, to the extent possible, of aircraft, vessels and vehicles employed in SAR operations, including those made available by other States.
- 13.3.4 The SAR plans of operation shall contain details regarding actions to be taken by those persons engaged in SAR, including:
- a) the manner in which SAR operations are to be conducted in the SRR;
 - b) the use of available communication systems and facilities;
 - c) the actions to be taken jointly with other RCCs;
 - d) the methods of alerting en-route aircraft and ships at sea;
 - e) the duties and prerogatives of persons assigned to SAR;
 - f) the possible redeployment of equipment that may be necessitated by meteorological or other conditions;
 - g) the methods for obtaining essential information relevant to SAR operations, such as weather reports and forecasts, appropriate NOTAM, etc.;
 - h) the methods for obtaining, from other RCCs, 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 SAR or other aircraft to proceed to aircraft in distress; and
 - k) cooperative actions to be taken in conjunction with ATS units and other authorities concerned to assist aircraft known or believed to be subject to unlawful interference.
- 13.3.5 SAR plans of operation shall be integrated with airport emergency plans to provide for rescue services in the vicinity of aerodromes including, for coastal aerodromes, areas of water.

13.3.6 The SAR service provider shall ensure the establishment of airport emergency plans that provide for co-operation and co-ordination with RCCs. In the event of an aircraft accident that occurs beyond the range of five nautical miles from an aerodrome reference point, the RCC shall be responsible for SAR, the aerodrome operator should organize the initial SAR within range of five nautical miles, unless mutual agreement states otherwise.

13.3.7 The SAR service provider shall establish RCC plans for response to MROs integrated with national disaster plans.

13.4 Search and rescue units

13.4.1 Each SRU 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 RCC informed of its preparedness.

13.4.2 The SAR service provider shall:

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

13.4.3 The SAR service provider shall ensure the capabilities establishment enabling:

- a) availability and deployment of suitably crewed, trained and equipped SRUs (including a pool of air search observers trained in visual search techniques), public and/or private, civil and military, for rapid SAR response;
- b) availability and deployment of SRU craft that may be in use for another primary purpose but made available to RCCs for SAR purposes on an as needed emergency basis (vessels, aircraft and land units);
- c) protocols for civil SAR authorities to request the assistance of military assets, and similarly military SAR authorities to request civil assets;

- d) a communication means and information protocols between the State's Aeronautical and Maritime SAR Authorities;
- e) cooperative use and/ or sharing of SAR assets with protocols incorporated within National SAR Plans and SAR Agreements;
- f) pre-arranged government authority for funding of costs associated with hiring of SRUs, and payment for critical supporting logistics such as fuel, to avoid any delays in response availability;
- g) pre-approval of specified SRU assets that may be utilized cross-border (requiring diplomatic pre-approval) or cross-SRR boundary (which may not require diplomatic approval if operating within international airspace); and
- h) aircraft with the ability and regulatory approval to safely conduct SAR missions.

13.5 Wreckage

13.5.1 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 SAR operations.

13.6 Distress Beacons

13.6.1 The SAR service provider should:

- a) where separate Aeronautical Rescue Coordination Centers (ARCCs) and MRCCs exist with responsibility for coincident aviation and maritime SRRs, coordinate distress beacon alert procedures to ensure both RCCs are aware of any distress beacon activations within their areas to avoid duplication of response.
- b) have a reliable distress beacon registration system that:
 - i. provides a readily-accessible mechanism (preferably one that is available by Internet as well as other conventional means) to enable distress beacon owners to fulfil their obligation to register Emergency

Locator Transmitter (ELTs) , Emergency Position-Indicating Radio Beacons (EPIRBs) and Personal Locator Beacons (PLBs), and update the registration data as information changes (e.g., change in ownership);

- ii. is available to RCCs 24 hours a day and includes up-to-date registration details for all national civil and military ELTs, EPIRBs and PLBs;
- c) take steps (including education) required to prepare for, and to implement changes related to, the introduction of second generation beacons, the transition to the Medium-altitude Earth Orbit SAR (MEOSAR) satellite architecture, and the pending Return Link Service provided by the Galileo constellation;
- d) establish an appropriate nationwide means of disposal for old distress beacons; and
- e) conduct promotional programs with relevant agencies, related to the minimization of false alerts.

Chapter 14 Operating Procedures

14.1 General

This Chapter sets out the standards for operating procedures.

14.2 Information concerning emergencies

14.2.1 Any authority or any element of the SAR service having reason to believe that an aircraft is in an emergency shall give all available information to the RCC immediately.

14.2.2 RCC shall, upon receipt of information concerning aircraft in emergency, immediately evaluate such information and assess the extent of the operation required.

14.2.3 When information concerning aircraft in emergency is received from other sources than ATS units, the RCC shall determine to which emergency phase the situation corresponds and shall apply the procedures applicable to that phase.

14.3 Procedures for rescue coordination centers during emergency phases

14.3.1 Uncertainty phase

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

14.3.2 Alert phase

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

14.3.3 Distress phase

Upon the occurrence of a distress phase, the RCC shall:

- a) immediately initiate action by SRUs 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 ATS 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 ICAO Annex 10, Volume III, are 121.5 MHz (for homing) and 406 MHz (for satellite detection and alert).
 - 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 immediately communicate such plan for the guidance of the authorities assisting in 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.

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

14.3.4 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 SRRs, the following shall apply:

- a) When an RCC 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 14.3 and confer with neighboring RCCs with the objective of designating one RCC to assume responsibility forthwith.
- b) Unless otherwise decided by common agreement of the RCCs concerned, the RCC to coordinate SAR 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 SRRs; 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 RCCs becoming aware of any information pertaining to the emergency shall inform the RCC that has overall responsibility.

- 14.3.5 Passing of information to aircraft in respect of which an emergency phase has been declared.

Whenever applicable, the RCC responsible for SAR action shall forward to the ATS unit serving the FIR in which the aircraft is operating, information of the SAR action initiated, in order that such information can be passed to the aircraft.

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

- 14.4.1 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.

14.5 Procedures for authorities in the field

- 14.5.1 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.

14.6 Procedures for rescue coordination centers — termination and suspension of operations

- 14.6.1 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.
- 14.6.2 The responsible RCC shall normally be responsible for determining when to discontinue SAR operations.
- 14.6.3 When a SAR operation has been successful or when the 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.

14.6.4 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.

14.7 Procedures at the scene of an accident

14.7.1 When multiple facilities are engaged in SAR operations on-scene, the RCC or RSC 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.

14.7.2 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 ATS 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 ATS unit.

14.7.3 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 ATS 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.

14.7.4 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.

14.7.5 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 14.7.4 or, if this is not practicable, by making the appropriate visual signal.

14.7.6 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.

14.8 Procedures for a pilot-in-command intercepting a distress transmission

14.8.1 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 ATS 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.

14.9 Search and rescue signals

- 14.9.1 The air-to-surface and surface-to-air visual signals in accordance with ICAO Annex 12 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.
- 14.9.2 Upon observing any of the signals in accordance with ICAO Annex 12, aircraft shall take such action as may be required by the interpretation of the signal given in accordance with ICAO Annex 12.

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