



Manual of Standards

Search and Rescue Services

CAAT-ANS-MOSSAR

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Approved By

Chula Sukmanop, PhD

Director General

The Civil Aviation Authority of Thailand

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Foreword

The General Director of Civil Aviation Authority of Thailand is responsible under Section 6/1 ,15/10 and 15/17 of the Air Navigation Act B.E. 2497 amended by the Air Navigation Act (No. 14) B.E. 2562 for issuing regulations, requirements, notifications, rules and orders to stipulate qualifications, rules, procedures, conditions, standards and practical guidance for the following matters to ensure conformity with current and timely International Standards.

The Manual of Standards (hereinafter ‘MOS’) is the means CAAT uses to meet its responsibilities under the Air Navigation Act B.E. 2497 amended by the Air Navigation Act (No. 14) B.E. 2562 for promulgating aviation safety standards. The MOS prescribes the detailed technical material (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 and Requirement 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 1.1.6.3).

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

Chula Sukmanop, PhD
Director General
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Chapter 1 Introduction

1.1 General

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

1.1.1 Background

1.1.1.1 This MOS is made under The Air Navigation Act B.E. 2497 amended by The Air Navigation Act (No. 14) B.E. 2562, Regulation of CAAT No. XX on Search and Rescue Services Standards refers to the standards and methods to be used in regulating:

a) the standards for compliance, include:

1) the Operations Manual;

2) the provider's organization, human resources management, personnel, training and exercises, facilities and equipment, management system, contingency plans, security program and documents and records;

3) cooperation, preparatory measure and operating procedures.

b) what is required to accompany an application for an Search and Rescue service provider's (hereinafter 'SAR service provider') certificate; and

c) discontinuance of the service.

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

1.1.2 Document set

1.1.2.1 The document hierarchy consists of:

- a) the Air Navigation Act B.E. 2497 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; and
 - b) Civil Aviation Authority of Thailand Regulation and Requirement² (the CAAT regulation and requirement); and
 - c) Manual of Standards (MOS); and
 - d) Advisory Circulars (ACs)
- 1.1.2.2 The Decree establishes the Civil Aviation Authority of Thailand (CAAT) with functions relating to civil aviation, in particular the safety of civil aviation, and related purposes.
- 1.1.2.3 The CAAT regulation and requirement establish the regulatory framework (Regulations) within which all service providers shall operate.
- 1.1.2.4 The MOS comprises specifications (Standards) prescribed by CAAT, of the detailed technical provisions that contains standards, procedures, instruction which are intended to form the basis of search and rescue services within Bangkok SRR. The SAR service provider in Thailand is required to comply with the provisions contained in this MOS. The SAR service provider shall document local procedures in their own operations manuals, to ensure the maintenance of and compliance with standards.
- 1.1.2.5 Readers should understand that in the circumstance of any perceived disparity of meaning between MOS and the CAAT regulations/requirements, the primacy of intent rests with the regulations/requirements. Where there is any inconsistency between the regulations/requirements and the MOS, regulations/requirements prevail.
- 1.1.2.6 A SAR service provider shall ensure that any search and rescue service that it provides is provided in accordance with:
- a) the standards set out in the Manual of Standards (MOS); and
 - b) the standards set out or referred to in ICAO Annex 12, ICAO Doc 9731 Volume I, II and III; as varied by Gen 1.7 of Part General and En-route of the AIP-Thailand.

1

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

- พระราชกำหนดการบินพลเรือนแห่งประเทศไทย พ.ศ.2558

2

- ข้อบังคับสำนักงานการบินพลเรือนแห่งประเทศไทย ฉบับที่ XX ว่าด้วยมาตรฐานการบริการการเดินอากาศ ด้านการค้นหาและช่วยเหลืออากาศยานประสบภัย

- ข้อกำหนดของสำนักงานการบินพลเรือนแห่งประเทศไทย ฉบับที่ XX ว่าด้วยหลักเกณฑ์และวิธีการขอและออกใบรับรองบริการการเดินอากาศ

- ประกาศสำนักงานการบินพลเรือนแห่งประเทศไทย เรื่องกำหนดนิติบุคคล อายุ และหน้าที่อื่นของผู้ได้รับใบรับรองบริการการเดินอากาศ พ.ศ. XXXX

- ระเบียบสำนักงานการบินพลเรือนแห่งประเทศไทย ว่าด้วยการจัดทำรายงานของผู้ได้รับใบรับรองบริการการเดินอากาศ พ.ศ. XXXX

- ระเบียบสำนักงานการบินพลเรือนแห่งประเทศไทย ว่าด้วยคู่มือมาตรฐานการให้บริการการค้นหาและช่วยเหลืออากาศยานประสบภัย พ.ศ. XXXX

- c) If a regional supplementary procedure set out in ICAO Doc 7030 relates to search and rescue service that the SAR service provider provides, the SAR service provider shall also ensure that the service is provided in accordance with that procedure.
- 1.1.2.7 ACs are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means of complying with the regulation and requirement. ACs may explain certain regulatory requirements by providing interpretive and explanatory materials. It is expected that service providers will document internal actions in their own operational manuals, to put into effect those, or similarly adequate, practices.
- 1.1.2.8 Where the SAR service provider is unable to comply with any provision in any of this MOS, the SAR service provider shall inform the CAAT within a reasonable period of time and in writing. The SAR service provider shall explain the basis for its non-compliance and propose alternative steps to ensure that an equivalent level of safety is established. The CAAT will review the SAR service provider's proposal in a timely fashion and approve the proposal, subject to such other conditions it may impose. The SAR service provider is required to follow-up diligently and thereafter report to CAAT within a reasonable period.
- 1.1.2.9 Where the CAAT has approved the SAR service provider's proposal in subsection 1.1.4.8, the SAR service provider shall record the approved alternative steps to be taken in the SAR service provider's operations manuals. The operations manuals shall also contain the details of and rationale for the alternative steps, and any result limitations or conditions imposed.
- 1.1.3 **Editorial Practices**
- 1.1.3.1 To avoid any misunderstanding within the MOS, the words 'shall' as used within the requirements indicate the compliance is compulsory' while 'should' means that it is strongly advisable that an instruction is carried out; it is recommended or discretionary.
- 1.1.4 **Differences Between ICAO Standards and those in MOS**
- 1.1.4.1 Notwithstanding the above, where there is a difference between a standard prescribed in ICAO documents and the Manual of Standards (MOS), the MOS standard shall prevail.
- 1.1.5 **Differences Published in AIP**

1.1.5.1 Differences from ICAO Standards, Recommended Practices and Procedures are published in AIP GEN 1.7.

1.1.6 **MOS Documentation Change Management**

1.1.6.1 The Air Navigation Services Standards Department (ANS) has responsibility for the technical content of this MOS.

1.1.6.2 This MOS is issued, and may only be amended, under the authority of the DGCA.

1.1.6.3 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,

1.1.6.4 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.

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

- a) to 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.

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

1.1.7 **Related document**

1.1.7.1 These standards should be read in conjunction with:

- a) Civil Aviation Authority of Thailand Regulation and Requirement;
- b) ICAO Annex 12 – Search and Rescue;
- c) ICAO Annex 13 – Aircraft Accident and Incident Investigation;
- d) ICAO Annex 19 – Safety Management;
- e) ICAO IAMSAR Manual (Doc 9731) Volume I Organization and Management;

- f) ICAO IAMSAR Manual (Doc 9731) Volume II Mission Co-ordination;
- g) ICAO IAMSAR Manual (Doc 9731) Volume III Mobile Facilities;
- h) ICAO Safety Management Manual (Doc 9859);
- i) ICAO Regional Supplementary Procedures (Doc 7030);
- j) AIP-Thailand

1.2 Definitions and Abbreviations

1.2.1 Definitions

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

Definition	Meaning
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
Distress phase	A situation wherein there is a reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger and require immediate assistance
Ditching	The forced landing of an aircraft on water
Emergency phase	A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase
Joint rescue coordination center (JRCC)	A rescue coordination center responsible for both aeronautical and maritime search and rescue operations
Operator	A person, organization or enterprise engaged in or offering to engage in an aircraft operation
Pilot-in-command	The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight
Rescue	An operation to retrieve persons in distress, provide for their initial medical or other needs, and deliver them to a place of safety
Rescue coordination 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

Definition	Meaning
Rescue subcenter (RSC)	A unit subordinate to a rescue coordination center, established to complement the latter according to particular provisions of the responsible authorities
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 facility	Any mobile resource, including designated search and rescue units, used to conduct search and rescue operations
Search and rescue service	The performance of distress monitoring, communication, coordination and search and rescue functions, initial medical assistance or medical evacuation, through the use of public and private resources, including cooperating aircraft, vessels and other craft and installations
Search and rescue service provider	The provider of search and rescue services within the Bangkok search and rescue region
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 unit	A mobile resource composed of trained personnel and provided with equipment suitable for of search and rescue operations
State of Registry	The State on whose register the aircraft is entered
Uncertainty phase	A situation wherein uncertainty exists as to the safety of an aircraft and its occupants

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
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
ATC	Air Traffic Control
ATS	Air Traffic Services

Abbreviations	Full Name
FIR	Flight Information Region
IAMSAR	International Aeronautical and Maritime Search and Rescue
ICAO	International Civil Aviation Organization
JRCC	Joint rescue coordination center
MOS	Manual of Standard
RCC	Rescue Coordination Center
SAR	Search and Rescue
SRR	Search and Rescue Region

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Chapter 2 Operations Manual

2.1 General

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 requirements set out in this Manual of Standards – Search and Rescue.

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 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 Bangkok SRR subject to 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 exercises;
- 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 form;
- b) ensure that SAR personnel have ready access to the operations manual; and
- c) amend the operations manual whenever necessary to keep its content up to date.

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

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Chapter 3 General Provisions for Search and Rescue Services

3.1 General

This Chapter sets out the general provisions for Search and Rescue 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, arrange for the establishment and prompt provision of search and rescue services within Bangkok SRR to ensure that assistance is rendered to persons in distress. Such services shall be provided on a 24-hour basis.

3.2.1.2 Those portions of the high seas or areas of undetermined sovereignty for which search and rescue services will be established shall be determined on the basis of regional air navigation agreements. The SAR service provider, having accepted the responsibility to provide search and rescue services in such areas, shall thereafter, individually or in cooperation with other States, arrange for the services to be established and provided in accordance with the provisions of this MOS-SAR.

3.2.1.3 Basic elements of search and rescue 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 Search and rescue services shall establish processes to improve service provision, including the aspects of planning, domestic and international cooperative arrangements and training.

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

3.2.1.6 The SAR service provider having accepted responsibility to provide search and rescue services shall use search and rescue units and other available facilities to assist any aircraft or its occupants that are or appear to be in a state of emergency.

3.2.1.7 Where separate aeronautical and maritime rescue coordination centers serve the same area, the SAR service provider shall 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. Joint rescue coordination centers should be established to coordinate aeronautical and maritime search and rescue operations, where practical.

3.2.2 Search and rescue regions (SRR)

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

3.2.3 Rescue coordination center (RCC) and Rescue subcenters (RSC)

The SAR service provider shall establish a rescue coordination center or within the SRR. The rescue coordination center and, as appropriate, rescue subcenter, shall be staffed 24 hours a day by trained personnel proficient in the use of the English language used for radiotelephony communications.

3.2.4 Search and rescue communications

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

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

3.2.5 Search and rescue units

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

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

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Chapter 4 Human Resources Management

4.1 General

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

4.2 Requirements

4.2.1 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.

4.2.2 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.

4.2.3 The SAR service provider shall document and define the method of determining staffing levels to ensure safe and efficient SAR operations.

4.2.4 The SAR service provider shall deploy sufficient number of staffs operated 24 hours a day by trained and qualified personnel.

4.2.5 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.

- 4.2.6 The SAR service provider should develop policies and procedures to enable recruitment and retention of adequate SAR personnel.

Chapter 5 Personnel

5.1 General

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.

5.2 SAR personnel qualification

- 5.2.1 The SAR service provider shall establish appropriate minimum qualification and experience requirements for the SAR personnel.
- 5.2.2 The RCC shall be staffed 24 hours a day by trained personnel proficient in the use of the language used for radiotelephony communications.
- 5.2.3 RCC personnel involved in the conduct of radiotelephony communications shall be proficient in the use of the English language.
- 5.2.4 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.
- 5.2.5 The RCC personnel should be fully qualified in SAR incident analysis, search planning and SAR operations management.

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Chapter 6 Training and Exercises

6.1 General

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

6.2 Training and Exercise

6.2.1 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.

6.2.2 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.

6.2.3 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.
- 6.2.4 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.
- 6.2.5 The SAR service provider shall maintain training records for their SAR personnel.

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 service in a safe, efficient, continuous and sustainable manner.

7.1.2 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 CAAT.

7.2 RCC facilities

7.2.1 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.

7.3 Search and rescue equipment

- 7.3.1 SAR units shall be provided with equipment for locating promptly, and for providing adequate assistance at, the scene of an accident.
- 7.3.2 Each SAR unit should have means of rapid and reliable two-way communication with other search and rescue facilities engaged in the same operation.
- 7.3.3 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.
- 7.3.4 Each search and rescue aircraft shall be equipped with a device for homing on distress frequencies.
- 7.3.5 Each search and rescue aircraft, when used for search and rescue over maritime areas, shall be equipped to be able to communicate with vessels.
- 7.3.6 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.

- 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 search and rescue operation should carry droppable survival equipment.
- 7.3.8 The SAR service provider should locate, at appropriate aerodromes, survival equipment suitably packed for dropping by aircraft.

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Chapter 8 Management System

8.1 General

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

8.2 SAR Quality Assurance

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.

8.3 SAR Management Review

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;
 - iii. 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.

8.4 SAR Promotion

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
 - viii. other States.

Chapter 9 Contingency Plans

9.1 General

- 9.1.1 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.
- 9.1.2 The contingency arrangements should be tested periodically, but 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 Security Program.

10.2 Security Program

10.2.1 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.

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Chapter 11 Documents and Records

11.1 General

This Chapter sets out the standards for Documents and Records.

11.2 Documents and Records

11.2.1 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.

11.3 Document Control

11.3.1 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.

11.3.2 These processes shall ensure that:

- a) documents are authorized by the CAAT 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.
- 11.3.3 Documents may be held as computer-based records provided that where paper copies of computer-based records are made, they are subjected to the same control as paper documents.
- 11.3.4 The SAR service provider shall, at CAAT's request, elaborate documents, records, copies of them or extracts from them, available for inspection by CAAT.

11.4 Maintenance of records

- 11.4.1 The RCC should keep a record of the operational efficiency of the SAR service provider in Bangkok SRR.
- 11.4.2 The RCC should prepare appraisals of actual SAR operations in Bangkok 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.

11.5 Retention period

- 11.5.1 Logs and diaries which contain SAR incident information shall be stored in permanent case folder.
- 11.5.2 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.

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 their search and rescue efforts with those of neighboring States. They should, 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.

12.2.2 Subject to the SAR agreements that had been concluded between Thailand and the SAR authorities or agencies of neighboring States, the SAR service provider shall permit immediate entry into its territory of SAR units of other States for the purpose of searching for the site of aircraft accidents and rescuing survivors of such accidents.

12.2.3 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.

12.2.4 Requests for the entry of aircraft, equipment and personnel from other States to engage in search for aircraft in distress or to rescue survivors of aircraft accidents should be transmitted to the RCC.

The RCC shall:

- a) immediately acknowledge the receipt of such a request, and
- b) as soon as possible, indicate the conditions, if any, under which the projected mission may be undertaken.

12.2.5 The RCC shall:

- a) request from other rescue coordination centers such assistance, including aircraft, vessels, persons or equipment, as may be needed;
- b) grant any necessary permission for the entry of such aircraft, vessels, persons or equipment into its territory; and

- c) make the necessary arrangements with the appropriate customs, immigration or other authorities with a view to expediting such entry.
- 12.2.6 The RCC shall provide, when requested, assistance to other rescue coordination centers, including assistance in the form of aircraft, vessels, persons or equipment.
- 12.2.7 The SAR service provider shall make arrangement for joint training exercises involving its SAR units, those of neighboring States and operators, to promote search and rescue efficiency.
- 12.2.8 The SAR service provider should make arrangements for periodic liaison visits by personnel of its RCC to the centers of neighboring States.

12.3 Cooperation with other services

- 12.3.1 The SAR service provider shall 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.
- 12.3.2 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.
- 12.3.3 The SAR service provider shall ensure that their search and rescue services cooperate with those responsible for investigating accidents and with those responsible for the care of those who suffered from the accident. To facilitate accident investigation, rescue units should, when practicable, be accompanied by persons qualified in the conduct of aircraft accident investigations.
- 12.3.4 The SAR service provider shall designate a search and rescue point of contact for the receipt of Cospas-Sarsat distress data.
- 12.3.5 For SAR purposes, RCC shall 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.

12.4 Dissemination of information

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

- 12.4.2 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.
- 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.

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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 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.

13.2.2 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.

13.2.3 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.

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 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.

13.3 Plans of operation

13.3.1 The RCC shall prepare detailed plans of operation for the conduct of search and rescue operations within its search and rescue region.

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 search and rescue 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 search and rescue 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 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.

13.3.5 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.

13.4 Search and rescue units

13.4.1 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.

13.4.2 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.

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 search and rescue operations.

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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 provider having reason to believe that an aircraft is in an emergency shall give immediately all available information to the RCC.

14.2.2 RCC shall, immediately upon receipt of information concerning aircraft in emergency, 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 air traffic services 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 air traffic services 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 SAR units 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 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.

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

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

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

- a) When a rescue coordination 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 14.3 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:
- the region in which the aircraft last reported its position; or
 - the region to which the aircraft was proceeding when its last reported position was on the line separating two search and rescue regions; or
 - the region to which the aircraft was destined when it was not equipped with suitable two-way radio communication or not under obligation to maintain radio communication; or
 - the region in which the distress site is located as identified by the Cospas-Sarsat system.
- c) After declaration of the distress phase, the RCC with overall coordination responsibility shall inform all RCCs that may become involved in the operation of all the circumstances of the emergency and subsequent developments. Likewise, all rescue coordination centers becoming aware of any information pertaining to the emergency shall inform the rescue coordination center 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 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.

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 search and rescue operations.
- 14.6.3 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.
- 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 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 air traffic services unit as much of the following information as possible:
 - type of craft in distress, its identification and condition;
 - its position, expressed in geographical or grid coordinates or in distance and true bearing from a distinctive landmark or from a radio navigation aid;
 - time of observation expressed in hours and minutes Coordinated Universal Time (UTC);
 - number of persons observed;
 - whether persons have been seen to abandon the craft in distress;
 - on-scene weather conditions;
 - apparent physical condition of survivors;
 - apparent best ground access route to the distress site; and
 - d) act as instructed by the RCC or the air traffic services unit.
- 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 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.
- 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 air traffic services unit of the distress transmission, giving all available information; and
- e) at the pilot's discretion, while awaiting instructions, proceed to the position given in the transmission.

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.