สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

Guidance Material for Search and Rescue Exercise (SAREX)

CAAT-GM-ANS-SAREX

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Approved by

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Director General of the Civil Aviation Authority of Thailand

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Table of Contents

0. Introduction

0.1 Background

In accordance with ICAO Annex 12 (Search and Rescue), the Civil Aviation Authority of Thailand (CAAT) has been promulgated "CAAT Rules on Manual of Standards of Search and Rescue Services" which requires search and rescue service provider to arrange appropriate Search and Rescue Exercises.

Guidance Material for Search and Rescue Exercise (SAREX) has been developed to assist search and rescue service provider about the SAREX arrangement, including the testing and complement in all functions of Aeronautical Search and Rescue (hereinafter 'SAR') Service for the readiness in actual SAR operation.

It should be clearly understood that this document has no legal status. It is intended to provide recommendations and guidance to illustrate a mean but not necessarily the only mean of complying with the Regulations, or to explain certain regulatory requirements by providing interpretative and explanatory material.

0.2 Purpose

The purpose of Guidance Material for SAREX is to provide advice to all SAR personnel, especially "Bangkok Rescue Coordination Center (Bangkok RCC)" staff to conduct their training and exercise as the following:

0.2.1 to develop SAREX

0.2.2 to develop an operation of SAR

0.2.3 conduct a standardized exercise for SAR services

0.2.4 other matter related to SAR

0.3 Applicability

Exercises test and improve operational plans, provide learning experience and improve liaison and coordination skills. Exercises, conducted on a realistic basis, help to demonstrate and assess the true effectiveness of training and the operational efficiency and competence of the SAR service. Exercises will reveal deficiencies that may exist in the National SAR Plan of Thailand and enable them to be improved. It is safer to have shortcomings revealed by exercises rather than during actual operations. The appendix O of the IAMSAR Manual Vol. I provides a sample template to serve as a guide to assist Bangkok RCC to develop a SAREX with its Search and Rescue Units (SRUs) as well as with one or more neighboring States.

This document is published on the CAAT website (www.caat.or.th) and will be an uncontrolled document when printed out, or when open as an electronic file from other sources than CAAT website.

0.4 Reference

0.4.1 ICAO Annex 12 Search and Rescue

0.4.2 CAAT Rules on Manual of Standards of Search and Rescue Services

0.4.3 International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual

1. SAREX Conduction

1.1 Type of SAREX

Exercises can and should be conducted on three levels.

1.1.1 The simplest type of exercise, a *communications exercise*, requires the least planning. It consists of periodic use of all means of communications between all potential users to ensure capability for actual emergencies.

1.1.2 A *coordination exercise* involves simulated response to a crisis based on a series of scenarios. All levels of the SAR service are involved but do not deploy. This type of exercise requires considerable planning, and usually one to three days to execute.

1.1.3 The third type, a *full-scale exercise or a field exercise*, differs from the previous types in that actual SAR facilities are deployed. This increases the scope of SAR system-testing and adds realistic constraints due to times involved in launching, transit and activities of the SRUs.

1.2 Other Consideration

The need for exercises varies. Base on SAR operations so exercises may add little to their learning experience, except when conducted with other States with which they may not routinely work. Other States may have very few SAR operations each year, so exercises will be critical to sustaining proficiency. Joint exercises among neighboring States or parties to SAR agreements will also be valuable. It may be necessary to assign persons full-time to planning and evaluating exercises.

Success of an exercise is measured by:

1.2.1 The simplest type of exercise, a communications exercise, requires the least planning. It consists of periodic use of all means of communications between all potential users to ensure capability for actual emergencies.

1.2.2 How many problems are discovered;

1.2.3 How much is learned;

1.2.4 How much operating plans are improved; and

1.2.5 How few mistakes are repeated during the next exercise.

SAR service provider should conduct regular SAREX regularly (at least once every two years) to test and evaluate existing coordination procedures, data and information sharing and SAR response arrangements involving:

a) both aeronautical and maritime SAR authorities including both civil and military agencies as applicable, and related bodies such as Air Navigation Service Providers (ANSPs) and Airline Operations Centers (AOCs);

b) where appropriate, cross-aeronautical Search and Rescue Region (SRR) boundary coordination (SAREX should routinely involve SAR authorities of adjacent SRRs); and

c) SAREX effectiveness through a post-SAREX review and written report, completed to ensure that deficient areas or latent problems are identified and remedied.

Note 1: A SAREX template is provided in the 2019 edition of the IAMSAR Manual, Volume I, Appendix O, Sample template for a joint SAREX.

Note 2: SAREX should test the SAR system, including unannounced alerts that allow an actual search (whether it is a desktop or a physical operation), to be conducted which will indicate weaknesses in the system. SAREX should not be confused with, or take the form of, simulated crash fire exercises such as for Aerodrome Emergency Procedures that do not have a search component.

Note 3: Real SAR incident responses which include an adequate post-response review and evaluation with lessons learned may replace the need for a SAREX.

2. SAREX Elements

Successful exercises require planning, execution and evaluation. Exercises are carried out for training, to evaluate established plans and procedures and to test new concepts. Exercises also offer experience in the management of risks and safety for SAR operations.

2.1 Planning

The typical exercise sequence involves:

2.1.1 development of the concept (broad goals and objectives) of what is to be exercised;

2.1.2 selection of participants (staff and facilities);

2.1.3 detailed planning for how the exercise will be conducted;

2.1.4 conduct of the exercise; and

2.1.5 evaluation to determine lessons learned and to develop recommendations for improvement.

It is essential to have a clear understanding of which plans and procedures are being exercised. Scenarios can then be developed that include specific situations to which personnel will react and respond. Response, or lack of response, to established policy and guidance, and need for additional policy guidance, is evaluated.

2.2 Execution

Those who plan exercises should not be the same ones who respond to the created scenarios. This avoids covering up known weaknesses to ensure ideal results, instead of revealing what would occur in an actual SAR situation.

2.2.1 Scenarios might be as realistic as possible. The decision as to how large and realistic exercises should be will depend on the extent of the SAR service, the demands expected to be made upon it and general considerations of economy. If primary responsibility for SAR has been delegated to military authorities or Government services, full-scale exercises involving as many units and facilities as possible may provide satisfactory means of implementing training programs.

Where private concerns are relied upon to play a major part in SAR, the timing of major exercises should be arranged so as to minimize disruption to normal activities.

2.2.2 Opportunities should be taken to complement formal training programs with exercises conducted on a unit basis by combining them with normal activities during quiet periods. They should be carried out at regular intervals and arranged so that all personnel participate. This is particularly important in respect of those facilities which seldom receive operational calls.

2.2.3 Exercises carried out separately by facilities will not be as valuable as combined operations, but they can ensure that the SAR service will function in an emergency.

2.2.4 As many facilities, including air and surface craft, should be exercised as possible. Communications between the SRUs is a vital test of coordination.

2.2.5 It is not always practicable for organizations to engage in formal SAR training programs. Whenever possible, personnel from these organizations should be invited to participate in or observe training exercises. They should be provided with documents, publications or other literature which describe the National SAR Committee (NSC) policies and procedures used by the SAR service, showing the desired roles of the participating organizations in SAR operations.

2.2.6 Bangkok RCC should periodically execute SAREXs together to develop and maintain efficient cooperation and coordination between their services. These exercises need not always be on a large scale, but at least those SRUs which are likely to operate together should engage periodically in coordinating exercises. Much may be learned by exchanging information on training methods (e.g. programs, literature, and films) and visits between staff of adjacent SRR.

2.2.7 Safety requirements, particularly when using live "survivors", may impose significant constraints on the conduct of SAREXs. Bangkok RCC should ensure that specific safety rules and limitations are issued for use during both the planning and conduct of SAREXs.

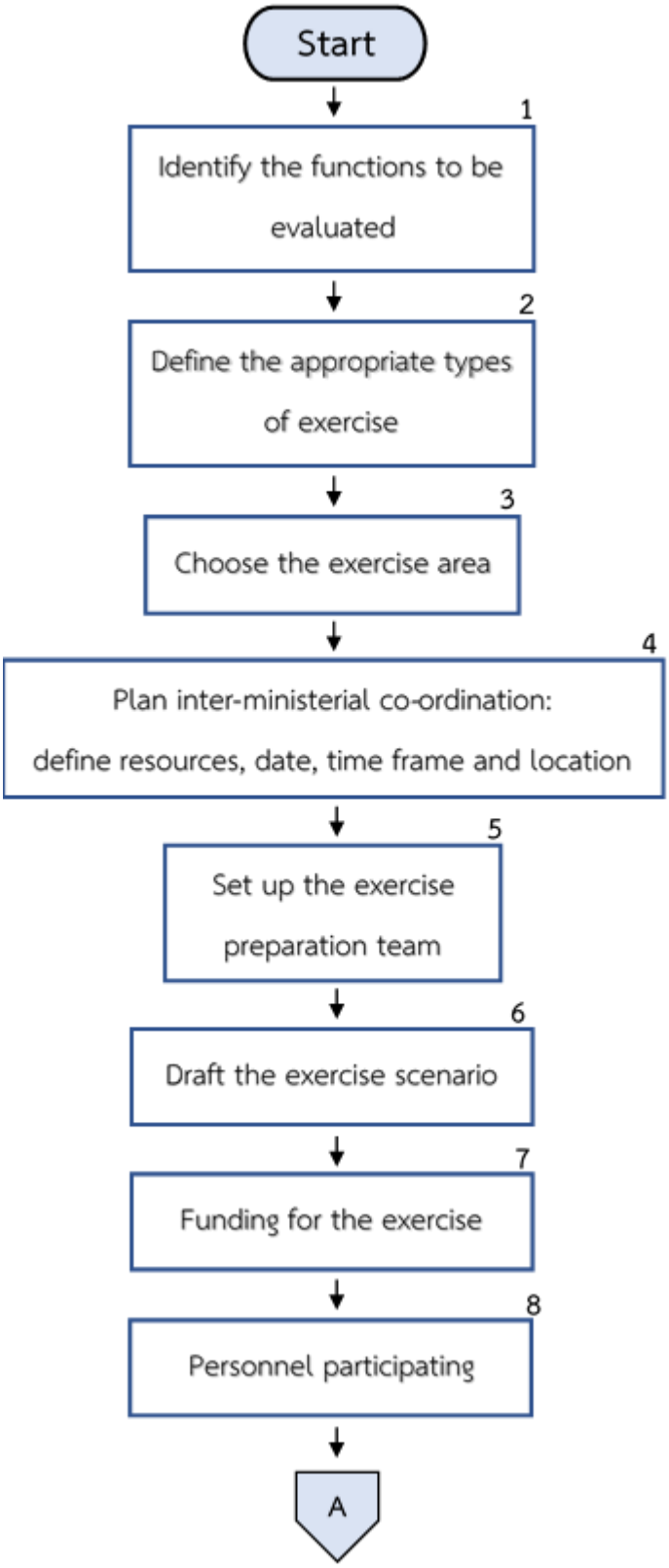
2.3 Evaluation

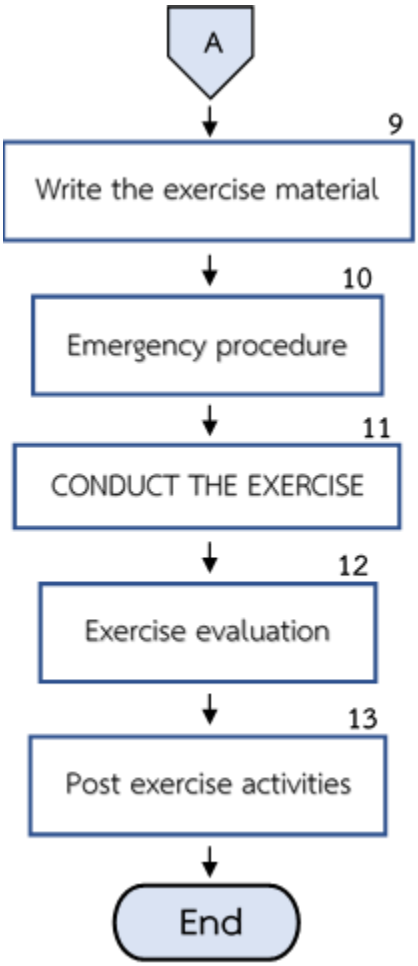
2.3.1 Before the SAREX / Training

2.3.2 During the SAREX / Training

2.3.3 After the SAREX / Training

3. SAREX Preparation




A
9
Write the exercise material
10
Emergency procedure
11
CONDUCT THE EXERCISE
12
Exercise evaluation
13
Post exercise activities
End

3.1 Identify the Functions to be Evaluated

The purpose of the SAREX is to evaluate the effectiveness of a functional element of the SAR system. Thus, before one defines the type of exercise to be organized, one might identify the functions that will be tested during the exercise. This first step will determine the subsequent preparations for exercise. Each exercise should be part of a yearly or even multi-year program of exercises which, when completed, will have tested the entire system. Ideally, several partial exercises should be organized each year and a full national or international exercise should be organized at least every two years. Lastly, at a later stage in the service quality control process, a set of procedures, based specifically but not exclusively on the exercises, will make it possible to control system quality and adapt the timing and nature of the exercises based on feedback from real cases, previous exercises, international documentation, the experience of neighboring States, etc.

No distinction is made, at this point, between sea, land or air units, nor on the status of these units (military, public safety, private...)

(See Appendix A for a SAR System Functions)

3.2 Define the Appropriate Types of Exercise

The purpose of an exercise is to evaluate the effectiveness of a functional element of the SAR system or the entire SAR chain. The type of SAREX is thus determined by the functions of the system to be tested.

Based on the exercise objectives, the preparation team chooses the type of exercise. This decision has an impact on which parties will be involved, how long it will take to prepare the exercise and the cost of the exercise.

The choice of exercise may also be determined by regulatory requirements, which may specify a minimal frequency for conducting each type of exercise.

The very first step in preparing a SAREX involves defining the purpose and objectives as precisely as possible.

Then, in addition to choosing the functional element to be tested, the exercise director will have answered certain vital questions in the very first phases of the preparations, *such as: will the exercise be held during the day or night? Will searches be held on land or on water (for the States concerned)? In the case of full-scale exercises, should certain specific types of SRUs be involved?*

3.3 Choose the Exercise Area

3.3.1 Plan the Exercise and Select the Area

The NSC determine, on a long-term basis, the areas where exercises will be organized. Normally, the SAR system should be tested by means of a full-scale exercise at least every two years.

3.3.2 Choice of Area

It is the responsibility of the exercise director to choose the exercise area, based on directives from the NSC, and, eventually, in conjunction with the local authorities concerned.

Selection of an exercise area is guided by whether the site engages the SAR system functionalities the organizers wish to test (limited accessibility, topography, inhospitable or sparsely populated area, sea or desert, tropical forest, swamps...). The director is, however, responsible for site safety, and will review the exercise area to identify specific features or aspects with a view to adequately evaluating and preventing risks.

Once the area is chosen, the exercise director drafts a request for a message of flight restriction in the related portion of airspace, namely a notice to airmen (NOTAM).

3.4 Plan Inter-Ministerial Co-ordination

It is the responsibility of the NSC to define, on an annual basis, the calendar for full-scale exercises. Note that under the terms of Annex 12 of the Chicago Convention and the IAMSAR manual, this committee normally includes high-level representatives from all departments involved in the national SAR system.

However, in States where the NSC is not functional, it may be desirable to institute, for full-scale exercises that require the deployment of operational units, an Exercise Commission, headed by the NSC, with representation from the authority that has the power to engage all parties that could be solicited during the exercise. The advantage of such a commission is that it would involve, from the very start, the parties who can make a technical, financial or administrative contribution.

This commission could include local authorities, as well as senior-level health, public safety, police or customs authorities, as well as national or international funders.

Such a commission validates the nature, scope and goals of the exercise and ensures that financial and logistical support is always available.

However, to maintain confidentiality, some or all of these prerogatives may be delegated to the exercise director.

No matter what the exercise scope and type, one of the first and most important actions, even before planning begins, is to assign responsibility for exercise planning to a competent person or group. To control events during the exercise, advance planning is required. Without such control, the exercise quickly becomes chaotic, with very little usefulness.

There are two categories of persons who work on preparing an exercise (except for a Communications Exercise)

3.4.1 The exercise preparation team (EPT)

3.4.2 The persons responsible for the operational side of the exercise. This second category, which cannot be fully known until after the scenario has been written, is further sub-divided into personnel responsible for supervising the exercise, and personnel in an operational role.

3.5 Set Up the Exercise Preparation Team

Defining and setting up the team responsible for preparing a SAREX can have a critical impact on the success of the operation. The process should fulfill two objectives:

3.5.1 Obtain the agreement of all departments likely to be involved in the activities related to the exercise.

3.5.2 Involve professionals to capitalize on their expertise throughout the process of organizing a SAREX.

Members of the EPT might be available and present for the entire period of the preparation, organization conduct, and evaluation of the exercise. A typical EPT is comprise of the following:

a) Exercise Director

The exercise director is appointed by national authorities to assume responsibility for the exercise from start to finish by:

i. directs and approves the work of the scenario team during the planning stage, in accordance with the purpose and objectives of the exercise, as defined by the committee or the NSC;

ii. directs the information meetings;

iii. performs the duties of chief controller during the exercise;

iv. when so delegated by the NSC, plans and conducts evaluation meetings; and

v. drafts the report at the end of the exercise.

The person appointed to this position is usually a fairly high-level representative of the main agency involved in the exercise, or a representative of the NSC. He or she may also be the head of the Bangkok RCC or an officer of the NSC or one of its collaborators.

b) Scenario Team

Assistant directors may also be appointed. It is important to note that the presence and availability of this authority should be guaranteed throughout the preparation, enactment and evaluation of the exercise.

The writing team might be made aware of the importance of keeping all of their preparatory work strictly confidential. To this end, it is desirable to keep the team as small as possible given the scope of the exercise.

The team's critical mission is to assist the exercise director in drafting the exercise scenario, based on the goals of the exercise and taking into account the identified resources. Once the scenario has been approved, the team might organize the logistics and prepare all the documents required for the exercise.

c) Logistic Support Team

Reporting directly to the exercise director and carrying out actions based on the scenario, the logistical support team is responsible for organizing the logistics required for the exercise to run smoothly.

This team's mission is twofold: on the one hand it helps execute the scenario (e.g.: placing of dummy objects, wreckage, a beacon, preparing victim identification cards ...); on the other it is responsible for background logistics of the exercise (meals, transportation, accommodation – as applicable), in accordance with the administrative and financial decisions made previously by the SAR Coordinator (SC) or the NSC.

Note: The team providing logistical support for the exercise might be careful to interfere as little as possible with the teams providing logistical support to the operational services involved in the exercise, which are also monitored during the exercise.

Like the members on the scenario team, the logistical support team might be made aware of the importance of keeping all of their work strictly confidential.

Note: Access to persons involved in the exercise in certain restricted areas (e.g.: Bangkok RCC) might be arranged before the exercise is conducted (appropriate accreditations might be provided by the competent authority).

3.6 Draft the Exercise Scenario

The scenario is based on the purpose and objectives of the exercise. When the exercise goals, objectives, type and area have been decided, the EPT writes the scenario for the exercise.

It is at this stage that the EPT decides on the operational difficulties to be encountered. For instance, it could write the following difficulties into the scenario:

3.6.1 bad weather conditions;

3.6.2 inaccurate eye-witness accounts;

3.6.3 no flight plan;

3.6.4 pilot navigation error;

3.6.5 critical period or time frame (night, weekend, holidays / statutory holidays);

3.6.6 critical location (sea, mountain, desert, swamp); and

3.6.7 technical communication problems.

3.7 Funding for the Exercise

The financial requirements for holding the exercise depend largely on the type of exercise, and more particularly on whether or not operational resources are deployed.

For communication and co-ordination exercises, the costs, given the fact that no resources are deployed, are minimal or nonexistent.

However, for a full-scale exercise, a number of expenses might be taken into account:

3.7.1 operations cost of resources deployed;

3.7.2 insurance for volunteers;

3.7.3 transportation (dummy objects, participants, visitors...);

3.7.4 acquisition of mannequin(s);

3.7.5 video equipment and operators;

3.7.6 overhead (office equipment, telecommunications...);

3.7.7 meals for participants; and

3.7.8 compensation for ham radio associations.

Usually, these costs (including operational unit costs) are assumed by the departments responsible for the resources deployed. However, in some States, provisions related to funding the operational costs of SRUs are set out in specific texts.

In addition, during the preparatory meetings, provisions for the funding of certain exercise costs may have been made based on the specific constraints of the exercise.

Repairing damage that occurs during an exercise is, unless otherwise stipulated, normally assumed by the author of the damage, the administration the author belongs to or its insurance.

3.8 Personnel Participating

There are 8 types of participants

3.8.1 Exercise Director and EPT

(As described in section 3.5)

3.8.2 Coordinators

The coordinators determine and control the pacing and direction of the exercise by transmitting messages to participants and observing their reactions. They work in the exercise control room and the field, under the orders of the exercise director, with whom they are in constant contact.

3.8.3 Observers

Observers might be present at the various locations where the operational actors are engaged. They observe and assess the conduct of the exercise, the transmission of messages and the reactions of the various actors. Observers fill in the evaluation forms developed during the preparation phase and are a key source of information at evaluation meetings and for the final exercise report.

Like coordinators, observers do not play a role in the scenario. They report any incident or accident that occurs during the exercise to the exercise director, with whom they are in constant contact. The number of control personnel (coordinators and observers) assigned to observe is not governed by set rules; it depends on the scope of the exercise, the number of participants, and the locations and agencies involved.

Ordinarily, the core group of control personnel is the EPT, because they developed the exercise and know every detail. The EPT may be reinforced by additional coordinators and observers, if warranted by the nature and scope of the exercise.

In a medium or full-scale exercise, the control staff should include at least one exercise director, three to five coordinators and as many observers. The same person may sometimes be both a coordinator and an observer.

3.8.4 Actors

There are 2 types of actors:

a) actors who generate events based on specific instructions and who play a role according to the scenario: witnesses, dummies, victims, passengers, etc.; and

b) operational actors reacting to events, who are not, in principle, given any instructions beforehand (with some exceptions). They carry out their ordinary roles (air traffic controllers, police, SAR mission coordinators, etc.). They act in accordance with the operational procedures of the different services to which they belong.

The sequence of events might be followed and coordinators might verify that actors ("players") are reacting realistically, that is, as if they were involved in a real incident. Control personnel might be aware of safety aspects during the exercise and the need to avoid damage to equipment.

3.8.5 Visitors

It is important to prepare for the presence of certain officials (ministers, department heads, other dignitaries) who will wish to attend all or part of the exercise. All officials / visitors might:

a) give the exercise director advance notice of their plans to attend, so that the exercise director can take appropriate measures;

b) be welcomed and escorted at all times by a designated coordinator;

c) wear exercise identifying items (badge, armband, scarf or jacke)); and

d) have attended a specific information meeting before the exercise.

Officials / visitors should not:

a) be left in the exercise area without an escort;

b) interfere in the scenario;

c) make a contact with or talk with actors; and

d) be in possession of confidential exercise documents before or during the exercise.

Some officials may wish to move about during the exercise. The organization and conditions of such movements might be carefully planned and prepared in advance.

3.8.6 Media

Any exercise of this type may, wittingly or unwittingly, attract media attention. As during a real rescue effort, a plan and methods for dealing with media pressure might be prepared in advance, so that all contacts with the media are managed appropriately.

In preparation for the exercise, a media/press resource person may be designated from the EPT to promote the event to certain invited media.

3.8.7 Video Operators

The organizers may wish to video the exercise so that they have a teaching aid for further training by the various departments involved. To that end, cameras may be placed in the accident area, in the Bangkok RCC, at the control center, etc.

However, it is important to carefully prepare and monitor this activity (specific schedule, special information meeting, mandatory accompaniment, specific identifying markers and advance information to all actors) so that the filming does not interfere with the exercise. In particular, a specific time schedule should be drawn up.

It might also be ensured, before videoing starts, that the legal provisions regarding image copyright are respected.

Lastly, video operators might maintain strict confidentiality.

3.8.8 Dummy Objects

A dummy is used to simulate wreckage or survivors, as realistically as possible. For example, during a search for survivors at sea, a buoy can be used to simulate an individual or a barrel to simulate a life boat. During an air-land rescue exercise, a scrapped bus or car can be used to represent aircraft wreckage.

The dummy object plays a critical role in the success of the exercise. It should be correctly placed, marked and protected so that it:

a) does not impede, wherever possible, normal activities in the area; and

b) is not subject to vandalism by people who are not involved in the exercise.

3.9 Write the Exercise Material

3.9.1 Exercise Documents

To be effective and achieve its purpose and objectives, an exercise might have prepared and directed with care. The idea is not to simply simulate an incident to see how people react. The direction and pace of the exercise might be controlled by following the scenario.

The content of the exercise materials changes with each exercise, but for full-scale exercises it usually includes the following:

a) general instructions and appendixes;

b) storyline;

c) specific narrations;

d) specific messages

e) sequence of events;

f) evaluation forms;

g) instructions to control personnel (chronology of specific messages and sequence of events); and

h) meeting schedule.

3.9.2 Document Color Coding

The different types of documents have different functions and are aimed at different persons or agencies. To eliminate any confusion and avoid the risk of a participant receiving too much information by accidentally seeing documents for controllers, material is usually printed on different colours of paper and documents are usually designated by their colour.

Although the choice of colours is not standardized, the following codes are provided as a guideline:

a) general instructions and appendixes – WHITE

b) meeting schedule – WHITE

c) storyline – WHITE

d) specific narrations – BLUE

e) specific messages – PINK

f) instructions to control personnel – GREEN

The *GREEN*, *PINK* and *BLUE* documents are classified "*EXERCISE - CONFIDENTIAL*."

3.9.3 General Instructions (WHITE)

This is the reference document for the exercise. It contains everything that participants must know (type, theme, objectives, participants, safety guidelines, logistics, limits of the exercise....). It usually contains the following sections:

a) Introduction (conventional exercise name, time frame, type of exercise, references, intended recipients...)

b) Purpose and objectives

c) Storyline

d) Participants in the exercise (EPT, actors, coordinators, observers, video operators, dummy object)

e) Conducting of the exercise (exercise perimeter, possible damage, visitors, identification signs/dress code, transportation, meal services, restrictions, aeronautical information, working language of exercise)

f) Exercise conventions (specific provisions)

g) Meetings (coordinators, observers, actors generating events / reacting to events, video operators)

h) Instructions about protecting documents (exercise documents, secret documents)

i) Communication methods specific to the exercise

j) Safety rules

k) Relations with the media

l) Reports by parties involved and final report

m) End of exercise

n) Appendixes (if any)

(See appendix C-1 for an example of General Instruction)

3.9.4 Meeting Schedule (WHITE)

A schedule of the various meetings (WHITE) must be drawn up so that participants have sufficient advance notice of meeting times. The schedule should state the dates, locations, target audience, parties attending and documentation required.

3.9.5 Storyline (WHITE)

Issued along with the general instructions, the storyline (WHITE) describes the situation that frames the exercise.

There are no special rules or principles for writing scenarios. However, it is strongly recommended that the names of real people or groups not be used, to avoid any confusion with real events.

It is also recommended that the exercise be given an explicit name, to distinguish it from any other activity or national exercise that could be held at the same time. For example, an exercise could be called SAREX.

It is also important to define a code for the downed aircraft that will not create confusion. Note that in the event of a simulated collision between two aircraft, a second code must also be defined.

The EPT writes the storyline after it has established the purpose and goals of the exercise. The text must give participants enough information so that they can interpret exercise messages correctly and react appropriately.

It is important to ensure that the "white notes" do not give too much information to participants. The white notes will be distributed to all participants before the exercise starts. If they contain too much information, actors will be able to act in advance of the messages and push the pace of the exercise faster that the EPT intends.

(See appendix C-2 for an example of a Storyline)

3.9.6 Specific Narrations (BLUE)

Specific narrations are texts that contain information prepared by the EPT and are issued to certain actors at the start of the exercise, which they will disclose during the exercise, either when asked, or at a predefined time, or after a sequence of events that concerns them.

At the start of the exercise, each actor is given their specific narrations. The specific narrations are not included in the storyline.

(See appendix C-3 for an example of a Specific Narrations.)

3.9.7 Specific Messages (PINK)

Specific messages are used to control the pace of the exercise by providing information as the exercise progresses. The content of specific messages is similar to that of specific narrations, except that they are not given out at the start of the exercise.

Specific messages generate actions. Thus, the actors to whom the messages are issued are event generators.

Some of the messages are drafted during the preparatory phase and the EPT knows when they will be disclosed; others are not planned nor even foreseeable at the start of the exercise, and are written and distributed by coordinators during the exercise (e.g.: the RCC goes in the wrong direction based on information from a witness; a specific message to the Mission Control Center (MCC) can generate a message from the MCC to the RCC based on Cospas-Sarsat information that "redirects" the search).

The timing of the transmission of the messages must be planned in advance to ensure the smooth and regular unfolding of events. In general, the messages are issued one after another in order to make it easier to analyze reactions during the subsequent evaluation of the exercise.

However, the coordinators, with the agreement of or on the initiative of the exercise director, can alter the timing of the messages to intensify the stress and tension of key actors, particularly the SAR Mission Coordinator (SMC).

In most cases, the messages will be written information transmitted by coordinators. But they could also be radio or telephone messages. In all cases the messages must be preceded by the wording EXERCISE – EXERCISE – EXERCISE to prevent any confusion about it being a real event; there is always a possibility that a real event will occur while an exercise is being conducted.

When the messages are written and analyzed, they are each assigned an ID number. The EPT prepares the messages following a standard format, which includes the following elements:

a) Message number

b) Date and time

c) Recipient

d) Mode of transmission

e) The words EXERCISE – EXERCISE – EXERCISE at the start and end of the text

f) Body of the message

g) Possible notes from control personnel

(See appendix C-3 for an example of a Specific Narrations.)

3.9.8 Instructions for Control Personnel (GREEN)

Control personnel (coordinators and observers) must be given precise and detailed information in order to control and direct the exercise in close coordination with the exercise director. They must therefore have a complete set of all documentation for the exercise, including the confidential green documents reserved specifically for them (sequence of events, chronology of specific messages and evaluation forms).

a) Sequence of events (GREEN)

The sequence of events sets out the basic plan for the exercise and provides details on the various events, execution times and expected reaction of participants. It is an important green paper document that may only be read by control personnel (exercise director, coordinators and observers).

The sequence of events is presented in a slightly different format than the specific messages; the messages are briefly described with the expected events and their possible repercussions. Control personnel can thus determine whether participants are reacting as expected.

(See appendix C-4 for an example of a Sequence of Events)

b) Chronology of specific messages (GREEN)

When all the planned specific messages (PINK) have been prepared and approved, they are arranged in chronological order to form the chronological set (GREEN) of specific messages.

It is important to distinguish between the PINK specific messages, distributed to actors, from the GREEN chronological set of messages which may only be read by exercise control personnel (controllers and observers).

c) Evaluation forms (GREEN)

Evaluation forms, as detailed in section 3.11.2 – 3.11.3, are prepared by the EPT and distributed to observers. These forms are tools used by observers to determine if the objectives of the exercise are being met.

(See appendix D for an example of an Evaluation Form)

3.10 Emergency Procedures

It is always possible for a real incident to occur during an exercise. The exercise might then be interrupted (suspended or stopped completely) in accordance with a predetermined emergency procedure.

The accident or incident information will be received at the Bangkok RCC. Given the exercise, a controller and/or an observer will be positioned at the Bangkok RCC and will immediately inform the exercise director who, based on the information received and in cooperation with the competent authorities, will decide whether to stop or suspend the exercise.

The following are examples of messages to stop or suspend the exercise:

EXERCISE – EXERCISE – EXERCISE

FINEX SAREX 50-05

REAL ACCIDENT.

EXERCISE – EXERCISE – EXERCISE

TEMPORARY SUSPENSION OF SAREX 50-05 EXERCISE

REMAIN IN POSITION AND AWAIT FURTHER INSTRUCTIONS.

3.11 Exercise Evaluations

Evaluation is an integral part of any exercise and the EPT might take it into account when choosing the site and drafting the scenario.

The purpose and objectives of the exercise should be prepared keeping the evaluation phase in mind. The objectives are usually "observable actions" that can be reported on by observers.

When the EPT prepares the exercise documents, it might also prepare observers' evaluation forms, to standardize the evaluation process. There is a standard method for preparing evaluation forms.

The quality of the valuation is largely dependent on having competent and well-informed evaluators.

3.11.1 Exercise Evaluation Process

The evaluation process is divided into three stages:

Before the exercise

a) Select the evaluation team (observers);

b) Establish the evaluation methodology; and

c) Inform and assign tasks to evaluation team.

During the exercise

a) Observe the actions of participants;

b) Record activities in registers and documents; and

c) Analyze the actions of participants.

After the exercise

a) Oversees the analysis of data collected from the evaluation team;

b) Coordinates the involvement of the evaluators in any post SAREX / Training meetings;

c) Coordinates and reviews the preparation of written reports;

d) Oversees the development of SAREX report and includes feedback through to the Training Planner; and

e) Guides the development of an improvement plan.

The committee that prepares the evaluation report is supervised by the exercise director. The exercise director can therefore carry out all the tasks related to the evaluation. Depending on the exercise, the observations can be complied by a chief observer for analysis and summary.

3.11.2 Evaluation Forms

Evaluation forms is a key role in the quality of the evaluation. The purpose of the forms is to:

a) Guide observers during the information-gathering process

b) Help observers gather specific information in an organized manner

c) Provide written data for efficient analysis and evaluation

The evaluation forms are used to evaluate objectives; they are designed to closely reflect the objectives of the exercise. This means that when the EPT sets those objectives, it must also take the evaluation process into account.

3.11.3 Evaluation form Content

The form must provide certain information, including the following:

a) Observer identification;

b) Observation location;

c) Observation time frame;

d) An assessment framework that shows, for each event (from the sequence of events), the time and nature of the event, the expected action, the action observed and the time it took; and

e) A blank box where the observer can write observations / comments / suggestions.

3.12 Post Exercise Activities

3.12.1 Final Report on the Exercise

The final report on the exercise analyses the extent to which each objective was achieved. SAR service provider should write a final report on the exercise, and send it to participants involved.

It identifies the strengths and weaknesses (deficiencies) revealed by the exercise and contains recommendations to improve the operational procedures of the various actors in the SAR system as well as the National SAR Plan of Thailand.

It can also be used to improve the organization of future exercises and the evaluation method.

The recommendations in the final report can be used by the NSC to suggest a plan for corrective action to the SC.

3.12.2 Action Plan to Correct Deficiencies

SAR service provider should elaborate a plan for corrective action and hold follow-up meetings to correct the deficiencies identified in final report. This action plan contains the following elements:

a) Findings (strengths, weaknesses);

b) Proposed corrective measures;

c) Time lines; and

d) Authorities responsible for implementation.

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4. SAREX Report

4.1 Report

A permanent record of the exercise, addressing each element, is necessary to disseminate valuable information and to maintain a historic file for later case studies, analyses and system improvements. A system of indexing and filing the reports is recommended for later retrieval.

(See Appendix E for an example of SAREX Report)

Example contents of the SAREX report

4.1.1 Executive Summary

It will be informed by the body of the report and will detail a summary of the outcomes of the exercise.

4.1.2 Recommendations

If an unmet Objective was mentioned in the Conclusions, it should be expanded on in the Recommendations. Each Recommendation should be succinct and usually no longer than one sentence. List and number Recommendations. Keep the sentences brief and clear, and use action-orientated verbs to start each. The substance of your Recommendations, along with supporting evidence, will be in the main body of your report.

4.1.3 Introduction

Succinctly introduce the readers to the exercise organization. Detail the type(s) of exercise and how it was planned and conducted.

4.1.4 Background

This section explains the context within which your evaluation was undertaken.

4.1.5 Findings

Convey the most important results of your evaluation. Relate to KPI's and sector standards. Make certain what you choose to include tells the complete story – both positive and negative findings. Quote the related evidence you have gathered to verify and support your findings. Be fair, balanced and objective.

4.1.6 Conclusions

Interpret your Findings for the reader in broad overarching statements. Refer back to the exercise Objectives. Answer the question of whether the in-scope Objectives were met, and the general extent to which that occurred.

4.1.7 Appendix

Specifically include evidence to substantiate Findings, Conclusions, Recommendations. Number the Appendices in order, title or caption each piece of information.

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5. Appendix

5.1 Appendix A: SAR System Functions

RCC Functions	*ATC Services Functions*	*SRU Functions*

PREPARATORY MEASURE	→	**AWARENESS**			
Update control lists and operational plans Update SRU inventory	RCC		Receive SAR phase initiation (from ATC) Receive information regarding a distress event (witnesses or other alerting post…)	Record information	Understand / analyze information
Update quick reference forms Update in-flight emergency assistance procedures	ATC	Emergency classification	Initiate SAR phase and transmit information regarding the distress event to RCC		
Maintain operational monitoring	SRU				

INITIAL ACTION				
Appoint an SMC and staff to provide assistance	Evaluate emergency level	Verify, gather information, initiate communication search	Mark the aircraft's trajectory on a map (known track + expected / estimated track)	Estimate time when aircraft would normally run out of fuel, check aircraft performance in hazardous flight conditions
Record information				
Notify parties concerned				
Transmit information about the distress event to the RCC (flight plan, eye-witness accounts, reported reception of a beacon signal by a pilot…)				

PLANING STAGE								
Estimate incident / accident area	Assess situation (weather conditions, topography ...)	Estimate Survivor motion after the accident (drift)	Estimate Search conditions	Chart Search areas	Identify, select and alert SRUs	Prepare search patterns	Assign search areas / search plans to SRUs	Develop and Communicate search plans
Record information								
Inform appropriate parties (services)								
Transmit distress event information (witnesses, pilot reporting reception of a beacon signal) to the RCC – continual updates								
					Receive information from RCC		Evaluate the situation, prepare the mission	

OPERATIONAL STAGE						
OPERATIONAL STAGE - Search						
Develop search plan	Assign search areas to SRUs / Brief SRUs	Coordinate search	Conduct and analyze personnel debriefing	Re-evaluate location of accident	Re-evaluate situation	Update search plans
				Select rescue method and choose resources to be used		
Record information						
Inform appropriate parties (services)						
Provide assistance at sea, if necessary						
Control SAR air traffic flying in controlled airspace						
	Receive detailed briefing from RCC		Debrief RCC (search results for assigned areas)			
		Coordinate operations in the field, if necessary, and as arranged with the RCC				
		Provide assistance at sea, if necessary				
		Remain in continual contact with RCC				
				Select rescue method and resources to be used, working closely with the RCC		

OPERATIONAL STAGE		
OPERATIONAL STAGE - Rescue		
Activate emergency plans and delegate eventual direction of rescue operations to competent authorities		
If no delegation, plan for accounting for survivors	If no delegation, activate appropriate medical units (fixed and mobile)	If no delegation, coordinate evacuation operations
Decide whether and what kind of survival equipment to drop		
Record information		
Inform appropriate parties (services) (accident investigations, police / coast guard...)		
Provide assistance at sea, if necessary		
Control SAR air traffic flying in controlled airspace		
Drop survival equipment, in accordance with orders from RCC	Provide rescue personnel and equipment, in accordance with RCC instructions	
Provide rescue personnel and equipment, in accordance with RCC instructions Coordinate operations in the field, if necessary, and as arranged with the RCC		
Provide assistance at sea, if necessary		

CONCLUSION				
Cancel Emergency phases	Decide to stop searches	Stop rescue operations	Suspend or close SAR operation	Produce report
				Produce report, if necessary (may not be necessary in case of INCERFA / ALERFA)
	Stop search operations	Stop rescue operations		Produce report

5.2 Appendix B: Example of SAREX Checklist

SAREX Checklist	Checking/ Note
1. Purpose of the SAREX *Ex.* *1.1 To practice Bangkok RCC staff, in all aspects of a wilderness SAR operation* *1.2 Implement National SAR Plan* *1.3 Conduct SAR operation* *1.4 Implement new technologies*	
2. Types of SAREX *Ex. A full-scale exercise*	
3. Exercise Area *Ex. "10Nm East with 5Nm North from VTPH VOR HHN area 5Km^2"* *4 coordinates of the exercise area* *3.1 Lat: xxx/Long: xxx* *3.2 Lat: xxx/Long: xxx* *3.3 ……*	
4. Plan inter-ministerial participation *Ex.* *4.1 Bangkok RCC* *4.2 Royal Thai Air force* *4.3 Airport of Thailand Public Company Limited* *4.4 Aeronautical Radio of Thailand Limited*	
5. Set up the Exercise Preparation Team *Ex.* *5.1 Specialist from Bangkok RCC* *5.2 Specialist from Royal Thai Navy*	

6. Draft the Exercise name and scenario *Ex. xxxxx*	
7. Funding for the Exercise *Ex.* *7.1 Scenario set up: xxx baht* *7.2 Helicopter cost: xxx baht* *7.3 Food: xxx baht* *7.4 Transportation: xxx baht*	
8. Personnel participating *Ex.* *8.1 EPT: xxx* *8.2 Coordinators: xxx* *8.3 Observers: xxx* *8.4 Actors: xxx* *8.5 .....*	
9. Exercise material *Ex.* *9.1 EPT: xxx* *9.2 Coordinators: xxx* *9.3 Observers: xxx* *9.4 Actors: xxx*	
10. Emergency procedure *Ex. (Establish "Code" or "Call" for a real emergency occur to stop or suspend the exercise)* *10.1 "Real Accident Real Accident Real Accident"*	

5.3 Appendix C: Example of Exercise Material

C-1 General Instructions Form (WHITE)

Conventional Name:	*xxx*
Period:	From *DD/MM/YYYY* to *DD/MM/YYYY*
Type of Exercise:	*"Communication", "Coordination" or "Full-Scale"*
Reference:	*xxx*
Recipients:	*xxx*
General:	*(explain the exercise briefly)*
Purpose and Objective:	*"To verify …", "To train …", "To test …" or any others.*
Participants:	*xxx*
Meeting:	The preparatory meeting for the exercise will be held on *"DD/MM/YYYY"*. The hot debriefing meeting will be held in the offices of *"XXX"* immediately after the exercise terminates. The final meeting will be held in the offices of *"XXX"* on *"DD/MM/YYYY"*.
Safety Rules:	*xxx*
Reports from parties involved and final report	*xxx*
End of Exercise	*(Following 2.13 Emergency procedures)*
Appendix	*(If any)*

C-2 Storylines Form (WHITE)

Example 1:

EXERCISE – EXERCISE – EXERCISE SAREX 50-05
A medium-size aircraft is flying under VFR with a flight plan from "town1" to "town2." It has not filed an arrival report to close its flight plan.

Example 2:

EXERCISE – EXERCISE – EXERCISE SAREX 50-05
Flight "VV WW" took off under IFR from "town1" heading for "town2." Just after takeoff it contacted air traffic control on "FFF" MHz. It was climbing toward flight level "FL". No contact has been established since then. It was supposed to contact "town3" regional control center on "FFF" MHz when it flew over the VOR "VVV" – start exercise.

Example 3:

EXERCISE – EXERCISE – EXERCISE SAREX 50-05
The control tower at "town1" receives a message from flight VV – SAR about a serious problem. The pilot mentions the loss of part of a wing and engine vibration. He says he'll try to make a forced landing in a field in …… (inaudible). End of radio transmission – start exercise.

Example 4:

EXERCISE – EXERCISE – EXERCISE SAREX 50-05
RCC receives a Cospas-Sarsat message with unconfirmed position – start exercise.

Example 5:

EXERCISE – EXERCISE – EXERCISE SAREX 50-05

A witness calls the police to say he has been waiting for an hour for a client who was supposed to arrive by plane at the "town1" aerodrome – start exercise.

C-3 Examples of Narrations Form (BLUE) / Specific Messages Form (PINK)

1. Report from a controlling agency that had contact with the craft in order to narrow down field of investigations

"The VV – SAR you're looking for contacted us at hh:mm to cross our area. It closed out of the area at hh:mm + 8 minutes. He was headed to "town1". It estimated beacon "BBB" at hh:mm + t" Upon request only, add: "IFF: 3/A flight level "FL" last position "PPP""

2. Report from an aerodrome member indicating a change in initial elements

"This morning I saw VV – SAR getting ready to leave, he was waiting for Mr. X, who didn't fly with him." "The pilot was worried; the plane had just come out of maintenance the day before. After taking off, he came back and landed again and raised the hood, did something inside and then took off again. I filled up the gas tank on the plane".

3. Police report from eyewitness

(Don't provide name or phone number, to test the reactions of the person who takes the call)

"At hh:mm I saw a plane that seemed to be having engine trouble and that was flying very low between "town1" and "town2"."

4. Cell phone contact with a passenger on a plane

(can't be contacted to test information and transmission of information)

"We just crashed into a forest. I'm trapped in the plane and the people in front are no longer responding .....I don't know where we are but about two minutes ago we flew over a large body of water .....; my battery is running out; come quick...." end of communication.

5. Initial elements

Available upon request at the start of the exercise because they are normally held by control services, but communicated at the request of the parties concerned; they will generate reactions but are not given to all participants at the start of the exercise.

6. Radio transcripts

Available at the control center level at the start of the exercise (specific narration) or at a time chosen by the control team (specific message), a transcript of air / ground communications on the control frequency will be communicated to the RCC upon request, after a certain technical delay.

7. Radar trajectory transcriptions

Available at the control center level (civil or military) at the start of the exercise (specific narration) or at a time chosen by the control team (specific message), the radar plots for the downed aircraft will be communicated to the RCC upon request, after a certain technical delay.

C-4 Example of Excerpts from Sequence of Events Form (GREEN)

"H" means an activation INCERFA (Uncertainty Phase)

Time	Event	Actor	Expected Actions
H1	Activate INCERFA	ATC	Contact from the RCC, activation of INCERFA
H2	Receive message INCERFA activated	RCC	Collect initial information, especially from controlling agencies [depends on specific procedures]
H2		RCC	Notify Cospas-Sarsat
H3	Request information received by RCC	ATC	Ask for information from other controlling agencies
H3		ATC	Ask aerodromes about route
H3		ATC	Ask aerodrome(s) about diversions
H3		ATC	Transmit initial elements to RCC

"Hn" means an activation DETRESFA (Distress Phase)

Time	Event	Actor	Expected Actions
Hn1	Activate DETRESFA phase	RCC	Assign search areas to SRUs
Hn1		RCC	Brief SRUs
Hn1		RCC	Send scramble order
Hn1		RCC	Activate Command Post (CP) local administration
Hn2	RCC receives scramble brief	(air) SRUs	Scramble
Hn3	RCC receives activation request	CP local administration	Activate ground units
Hn4	CP local administration receives activation request	Ground units	Deployment

5.4 Appendix D: Example of Evaluation Forms

(One sheet per agency controlled)

Date: *DD/MM/YYYY* Name of exercise: *xxx*

Observer's name: *Mr / Ms / Mrs X* Location of observation: *xxx*

Expected Time of Event	Event	Actor	Expected Reactions	Real Time (amount of time)	Observed Reactions	Comment/ Suggestions
H1	Activate INCERFA phase	SMC 1	Collect initial information, particularly from control agencies [depend on specific procedures]	H1 + Δt	Call controlling agency 1 to request info. From aerodromes 1, 2 and 3	
H1		SMC 1	Notify Cospas-Sarsat	H1 + Δt'	Send message to MCC town 2	Time it took operator to respond considered too long
				:		
Hn	Activate DETRESFA phase	SMC 1	Assign search areas to SRUs	H1 + Δt	Call local administration CP	Lost time looking for new phone number of contact person / update directory
Hn		SMC 1	Assign search areas to SRUs	H1 + Δt'	Call air base town 4	
Hn		SMC 1	Brief SRUs	H1 + Δt1	Call air base town 4	Forgot to transmit info. About color of downed craft
Hn		SMC 1	Send scramble order	H1 + Δt2	Call air base town 4	
Hn		SMC 1	Activate local administration CP	H1 + Δt3	Call local administration CP	Lost time because contact was unfamiliar with SAR procedures

5.5 Appendix E: Example of SAREX Report

SAREX REPORT
1. Executive Summary
(Description)
2. Recommendations
(Description)
3. Introduction
(Description)
4. Background
(Description)
5. Findings
(Description)
6. Conclusions
(Description)
7. Appendix
(Description)