

INTERNATIONAL CIVIL AVIATION ORGANIZATION



GUIDANCE MATERIAL TO CAAs FOR SEARCH AND RESCUE OPERATIONS AND TRAINING OVERSIGHT

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1 Background

Search and rescue (SAR) operations can be among the most demanding of civil aviation environments. Lives can be at stake in remote and hostile environments, which may exceed the capabilities of commercial air transport aircraft and crews. To ensure a timely response, SAR operations require specialist equipment, crew training and medical provisions in order to achieve a timely response, a safe transit and search, effective rescue and an efficient recovery to a place of safety. This requires specific considerations for the training of, and operational conduct of, SAR.

In many cases SAR may now be an element of a larger Government services contract that requires other operational capabilities to be provided from other regulatory frameworks, such as those for commercial air transport (CAT). An integrated approach to regulatory oversight is therefore often required to achieve an effective service delivery.

This document provides a framework to guide States in establishing a SAR oversight programme which is integrated with their National SAR Plan. Where relevant, other considerations are to be included using a risk-based approach.

2 Aim

International SAR operations will be more effective when neighbouring States utilize a standardized approach to initiating, establishing and maintaining a national SAR system. This guidance document outlines a recommended framework for overseeing SAR operations for European States, in line with ICAO Annex 12 and the IAMSAR Manual.

3 Regulatory Framework

Each national CAA may adopt its own preferred method of executing SAR oversight. It is not the intention of this document to explicitly describe how a State should construct a regulatory framework for SAR. Terms used may include, ‘SAR regulation’, ‘SAR rules’, a ‘SAR approval’, a ‘SAR AOC’, among others. For the purpose of this guidance material the term, ‘SAR regulation’ will be used.

4 Abbreviations and Definitions

It is not the intention of this guidance material to change existing terms for CAAs or other interested parties, but to provide a uniform way of interpreting terms used throughout this document. Terms related to SAR used in this document are aligned with ICAO Annex 12, *Search and Rescue*.

Abbreviations and acronyms

AOC	Air Operator Certificate
CAA	Civil Aviation Authority
CAT	Commercial Air Transport
FTL	Flight Time Limitations
FRM	Fatigue Risk Management
HEMS	Helicopter Emergency Medical Service
IAMSAR	International Aeronautical and Maritime Search and Rescue
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
NVIS	Night Vision Imaging System
Ops	Operations
SAR	Search and Rescue
SMS	Safety Management System
VTOL	Vertical Take-off and Landing
WOCL	Window of Circadian Low

5 National SAR Oversight Programme

A State CAA should use the content in this guidance manual to initiate a new, or to enhance an existing, SAR oversight programme as an integrated component of their National SAR Plan.

It should be ensured that the State Safety Programme encompasses SAR activities.

It is recommended using a performance-based oversight methodology that encompasses the principles of safety management and compliance monitoring in order to enhance SAR safety.

6 Recommended CAA SAR Oversight Framework

The following framework has been used for over a decade by a small number of States with a relatively mature SAR system. This section should be subject to continuous improvement through feedback from CAAs to develop and evolve the standardisation of a State SAR oversight framework.

6.1 Abbreviations and Definitions

There should be a consistent method to refer to terms used in the CAA's SAR oversight programme which avoids conflict with Annex 12, IAMSAR, IMO and other international standards.

6.2 National Legal Requirements

Clear distinction should be made between SAR elements under a Government contract and other elements that may fall under other regulations, such as an air ambulance and helicopter emergency medical service (HEMS), which is commercial air transport, Coast Guard activities, border patrol, police, firefighting, and other State activities.

Where appropriate, CAA SAR oversight should be integrated with the National SAR Plan.

6.3 Scope of SAR Regulations

CAAs should consider how to integrate SAR regulations into other applicable regulations to provide clarity for operators and crews during a SAR tasking if they transition mid-flight to another element of a Government service contract.

6.4 SAR SMS

The state should ensure that SAR operators are required to have a safety management system (SMS) as part of the company management system/quality management system, in line with Annex 19. This may be achieved by requiring a SAR operator to hold an AOC in accordance with Annex 6.

SAR is not commercial air transport or aerial work / specialized operations, therefore, consideration should be given to creating a more appropriate methodology for robust oversight of SAR contracts and/or Government contracts that include SAR. An SMS element specific to SAR is the requirement for a SAR crew to conduct dynamic risk assessments during a SAR task, or at the scene of a SAR event, to a much greater extent than during commercial air transport operations. A dynamic risk assessment enhances the ability to positively respond to a continuously developing SAR situation.

6.5 Operational Requirements

6.5.1 Company Operations Manual

Guidance to operational SAR crews should be laid out in the company operations manual in line with Annex 6. Flexibility should be exercised in terms of whether it is a dedicated SAR ops manual or a company operations manual with a SAR supplement (for example, an oil and gas ops manual), as applicable.

6.5.2 Aircraft Performance

Aircraft performance requirements for SAR operations may need to go beyond commercial air transport requirements at times, if appropriate. This should be subject to a SAR risk assessment to determine a SAR operations performance policy. Consideration should also include performance requirements for SAR training, as there may be times when performance requirements for advanced SAR training may match SAR operational requirements.

6.5.3 SAR Crew

Consideration should be given to how SAR crew competence is assessed. For instance, is a SAR rating on a flight crew licence appropriate? Are SAR technical crew to be licenced? Are company attestations suitable?

6.5.4 SAR Technical Crew Medical Requirements

States should assess whether a flight crew Class II medical is appropriate for SAR technical crew members, or whether a new medical standard needs to be developed and published.

6.5.5 SAR Operating Minima

SAR operations and training may require different minima to commercial air transport/specialized operations due to the nature of the task. These minima need to be established through SAR safety risk assessments outlined by the CAA and conducted by the operator.

6.5.6 Fuel policy

The operator should establish SAR fuel policies for operations and training that are acceptable to the CAA based on appropriate SAR safety risk assessments.

6.5.7 SAR Role and Medical Equipment

A matrix of SAR equipment, appropriate to the various roles that are expected to be flown, and the associated medical equipment should be developed. This may require liaising with the national health service or equivalent.

6.5.8 Communication Equipment

Relevant SAR communication equipment should be detailed and published. SAR call signs are to be allocated to distinguish SAR operations from commercial air traffic.

6.5.9 SAR Operating Base Facilities

A SAR operator should provide relevant facilities for planning and rest/overnight accommodations as appropriate to the immediate and standby readiness requirements of the contract.

6.5.10 SAR Passengers

The carriage of personnel other than SAR crew needs to be considered, as long as their function is relevant to the flight; such as specialist rescue or life-saving personnel, medical professionals, survivors and their family, ill or injured persons directly involved, ground/maritime emergency service personnel, and other persons as accepted by the CAA.

For regular SAR passengers, such as lifeboat crews, mountain rescue teams, medical professionals etc, an operator's training course could be established to supplement or replace the requirement to conduct a passenger safety brief on every flight.

6.5.11 SAR Flight Time Limitations (FTL) and Fatigue Risk Management (FRM)

A flight time limitations policy and/or fatigue risk management programme/policy/system/guidance should be established based on relevant data (Refer to Appendix 1).

6.5.12 Airworthiness Considerations

Any installation of SAR equipment or modification of an aircraft is subject to State airworthiness certification requirements.

6.6 Training Requirements

The operator should establish a SAR training and checking programme for SAR crews and relevant categories of regular SAR passengers which is relevant to the operating environment.

6.7 Helicopter, Aeroplane and UAS Considerations

While this guidance material mostly covers the specialist area of SAR helicopter operations and training requirements, the larger SAR system elements should also be considered, such as aeroplanes and unmanned air systems, and VTOL aircraft.

7 Summary

The regulatory oversight of SAR operations may often be more specialized than commercial air transport or specialized operations and SAR experienced personnel are not always available due to SAR commonly being viewed as a vocation by the crews. This standardized aviation SAR framework approach is intended to offer a robust oversight programme that integrates with the State Safety Programme and National SAR Plan to contribute to the national, regional and global SAR systems.

Appendix 1 Developing Fatigue Management for Helicopter SAR Operations

There are several considerations and key elements that should be included in fatigue management requirements for SAR operations. While a generic framework should be developed by the State, these differing areas should also be refined using knowledge of the specific operational and organization context of the SAR operator.

ICAO Doc.9966 and the associated guidance document for Helicopter Operators (which can both be found here [Resources \(icao.int\)](https://www.icao.int)) provides a framework for both the regulators and their operators. This guidance is developed to further support the information provided in those documents, in particular chapter 4. However, there are several specific areas affecting SAR operations that require additional consideration.

SAR operations are subject to the effects of ICAO's four scientific principles, and they are usually carried out in a higher risk environment. They require consideration of workload, including over and under arousal states and anticipatory stress associated with being on call, as well as the environment where crew are both working and resting.

While they are subject to unpredictable flying operations, they will be operating in an environment where consideration of rates of callout can be used in support of the development of limitations. This often requires additional operationally specific considerations when developing minima and maximum work periods and requirements for rest and non-work periods of time.

Identifying Numerical Limits

States must base their prescriptive limitations and requirements on scientific principles. In general, this means they:

- provide adequate sleep opportunities prior to duty periods;
- limit the duration of work periods and identify minima for non-work periods to allow for adequate recovery;
- limit consecutive and total work periods over defined periods of time, in order to prevent cumulative fatigue;
- consider the impact of commencing duties at different times of the day;
- consider the impact of undertaking duties within a window of circadian low (WOCL);
- consider whether the duty is being undertaken by a single operational person or a team;
- consider the impact of workload during the work period; and
- avoid extended periods of being awake when assigning unscheduled duties (e.g. standby).

Identifying limits for SAR operations is more than simply identifying a maximum work duty period and a minimum rest period. Operational knowledge may relate to such elements as:

- historical call out rates for that specific service will support the development of the duty length and off-duty requirements;

- workload impacts: operating within the specific environment (weather and topography); specific helicopter type; use of technology (such as NVIS); use of safety equipment (such as wearing of survival suits); additional crew members (such as winch operators or swimmers); rate of operation within the WOCL;
- helicopter base impacts: location of helicopter base; facilities for rest and operational support at base; remote site locations; network support (ability to close a base based on call out timing and rate and provide cover from another base); and
- safety management integration; ongoing fatigue monitoring approaches; level of fatigue management training; level of operational control by the service provider.

The day-to-day operational reality of a specific operating environment plays an important role, particularly when determining appropriate mitigations for workload related fatigue hazards.

Prescriptive limits should consider the following areas:

- length of individual duty periods;
- response time from call out (day and night differences);
- rest periods between duty periods;
- number of consecutive duty periods;
- combinations of consecutive duty periods;
- long blocks of recovery time after blocks of consecutive duties;
- limitations on flying hours within a duty and over a week / month / year;
- rest period accommodation requirements;
- type of on-base rest and sleep facilities (where applicable);
- discretion to operate beyond individual duty limits and associated mitigations and restrictions; and
- positioning, commuting and working in remote locations (such as based on an oil rig or remote helipad location).

With regards to prescriptive limits, consideration should be given to the management of continuous wakefulness and where the limits of duty are extended beyond normal helicopter prescriptive requirements, the State should consider:

- the relationship between the duration of the overall length of the duty period and the ability for the crew member to sleep within their normal WOCL;
- the suitability of available sleeping facilities;
- the need for sleeping, napping and fatigue reporting protocols to be established; and
- the recording and retention of duty, flying hour and rest periods, including the use of discretion to extend duty or reduce rest.

SAR operations by their nature are specific to their operational and organizational environments. Therefore, States may require additional regulations to ensure that the service provider demonstrates the effective management of fatigue risks within the constraints of the prescribed limits. Such requirements may address:

- stability of work patterns;
- fatigue reporting;
- base closure rates due to workload and / or call outs within the WOCL;

- allocation and management of training duties;
- management of crew members who hold additional organisational responsibilities;
- SMS identification and management of specific operational fatigue risks and mitigations;
- inclusion of specific and detailed fatigue management training for all crew and those that manage or many impact of fatigue of the crew, within the operation; and
- development of specific operator and individual responsibilities towards fatigue.