IS-BAO

An International Standard

for

Business Aircraft Operations

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Foreword

The IS-BAO - An International Standard for Business Aircraft Operations was developed by the business aviation and international helicopter communities for the benefit of those communities. The purpose is to promote global standardization and to assist operators in establishing quality flight operations using best practices of business aircraft and of commercial and non-commercial helicopter operations world-wide.

Although the IS-BAO was developed with the purpose of self-determination, other long term benefits are possible through development of an industry based third-party registration programme similar to the ISO - 9000 series (see Chapter 2.0). The business aviation and helicopter communities may also wish to promote the IS-BAO to regulators and standards setters as an acceptable basis for rulemaking.

While the IS-BAO is a set of standards that reflect business aviation best practices world-wide, a management process has been designed to ensure its long-term growth and development. The IS-BAO management process involves all IBAC member national and regional business aviation associations and international helicopter associations. It is under the direction of the IS-BAO Standards Board. It includes the submission of recommended revisions from participating operators and their national and regional associations, plus an annual review by the Standards Board.

The first draft of the IS-BAO was completed using a number of existing documents such as the NBAA Management Guide, the BAUA Generic Operations Manual and Canadian CAR 624 Standards. This first draft was then reviewed by a small group of operators who served as a focus group to confirm the benefits of the IS-BAO and provide preliminary comments on its structure and content. From these comments a second draft was developed. It was reviewed through a series of operator focus group meetings in North America and Europe and a standards integration meeting involving representatives from the focus groups. A third draft was then developed. It was presented at EBACE 2001 in Geneva and was then tested with operators in North America, Europe and South America. The feedback from the EBACE presentation and the operator tests was used to develop the final edition. It was approved by the IS-BAO Standards Board on December 10, 2001 who has since then managed it on behalf of the IBAC Governing Board. In that process, feedback has been gathered from users, auditors and subject matter experts. This feedback provides the basis for the annual update of the IS-BAO and related documents. In 2010 and 2011 IBAC worked with the Helicopter Association International (HAI), the British Helicopter Association (BHA) and the European Helicopter Association (EHA) to adapt the IS-BAO to include helicopter operations which resulted in the second edition of the IS-BAO.

The IS-BAO and accompanying Generic Company Operations Manual were developed for voluntary application by business aircraft operators. The IS-BAO is a performance based standard that provides for different implementation options, depending on the specific operation. For the helicopter community the HAI has developed and manages a set of “helicopter mission specific standards” to augment the IS-BAO.

Release and Disclaimer for Use of IS-BAO

The information contained in the IS-BAO – an International Standard for Business Aircraft Operations is subject to continuous review and reasonable efforts are made to ensure its contents are current. However, no one should act or rely on the basis of any such information without referring to the applicable laws in their particular jurisdiction and without obtaining appropriate professional advice. The International Business Aviation Council (IBAC) shall not be held responsible for any loss or damage caused in any way, including by errors, omissions, inaccuracy, interpretation or misinterpretation, whether negligent or not. IBAC hereby disclaims any and all liability to any person in respect of anything done or omitted to be done by any person purportedly in reliance on the IS-BAO.
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1.0 Purpose of the Standard

1.1 General

This publication represents an International Standard for Business Aircraft Operations (IS-BAO).

The primary purpose of the standard is to promote the harmonization of quality operating practices for business aircraft and helicopter operations on the international level. It constitutes “base line” requirements which operators should apply in structuring and staffing their organization and planning and conducting their operations.

The IS-BAO has been developed with the generally accepted principles of other international standards systems in mind. It also has been designed to be compatible with operator certification and range of quality systems. The safety management systems (SMS) standards set out in Chapter 3 are, in particular, consistent with the ICAO SMS Framework.

Implementation of IS-BAO by operators may also serve to satisfy certain national regulatory requirements applied by States and their civil aviation authorities (CAAs). Operators remain responsible for ensuring that all applicable national requirements are met.

1.2 Applicability

The standards contained within this document have been developed to be used and adapted for operation of a wide variety of aircraft, from multiengine, turbine-powered, pressurized aeroplanes to helicopters. The IS-BAO contains a set of standards and recommended practices that are based upon business aviation best practices, developed by the industry for the industry. The IS-BAO is designed to be flexible in nature so that operators can implement the requirements that pertain to their operations and set aside those that are not relevant.

The IS-BAO contains some standards and recommended practices that apply to all operators and others that apply only to either fixed wing operators or rotary wing operators. Some of the requirements refer specifically to aeroplanes or helicopters and as well the aeroplane specific requirements have an “A” suffix to the element of item number and the helicopter specific items have an “H” suffix. Also, some of the general provisions would not be applicable where the operator does not engage in that activity.

Appendix A was initially developed to specifically address the application of the IS-BAO standards to very light jets and other technically advanced aircraft. It has since been modified to include single pilot helicopter considerations. This supplement is accompanied by a single pilot generic operations manual which is included on the IS-BAO CD. For helicopter operators the HAI has developed a set of mission specific standards some of which include single pilot considerations.

Operators are encouraged to implement the standard contained in this publication. It is designed as an industry standard intended to foster universal application of best practices. Adoption of IS-BAO by an organization is the organization’s choice. However, in the interest of international harmonization, States and regional bodies considering establishing new requirements for business aircraft operations or revising existing requirements are equally encouraged to consider the standard in their rule and standards-making activities.
1.3 Registration

Operators that have purchased and adopted the IS-BAO have the option of having the organization registered with the International Business Aviation Council (IBAC). To be registered the operator must arrange for a third party audit by an accredited IS-BAO auditor. Operators that successfully demonstrate conformity with IS-BAO will receive a Certificate of Registration from IBAC. A copy of the Registration Application is contained in Appendix B and a Registration Renewal Form is contained in Appendix C.

The Certificate of Registration is an attractive, professional document suitable for mounting so that the staff, passengers and other customers will be aware that the organization meets a highly professional industry code of practice. A second certificate, or additional certificates to be carried in aircraft as proof of registration, are available at no additional cost.

1.3.2 IS-BAO standards are designed to enable a registrant to progress from a strong foundation of conformance to SMS principles and compliance with international standards to a system that demonstrates goal-directed continuing performance. The program leads the operator from establishment of beginning principles to a sustainable SMS and operations program through a number of steps. Audits conducted normally every two years ensures conformance and provides valuable feedback to the operation. Audits concentrate on SMS development. For IS-BAO SMS evaluation purposes, the stages of maturity of an SMS are:

a. Stage One – Confirms that the SMS infrastructure is established and that safety management activities are appropriately targeted. All supporting standards have been established.

b. Stage Two – Ensures that safety management activities are appropriately targeted and that safety risks are being effectively managed. This is the baseline that meets the requirements specified in IS-BAO Section 3.2, Safety Management System Requirements.

c. Stage Three – Verifies that safety management activities are fully integrated into the operator’s business and that a positive safety culture is being sustained.

1.3.3 The IS-BAO registration system is progressive in nature, requiring registrants to achieve and maintain SMS program standards. A registrant is required to progress to and maintain at least Stage Two to remain registered. Stage Three is an optional but desirable level of achievement for operators. Other features of the registration program are:

a. The Certificate of Registration is normally issued for a period of two years from the end of the month in which the audit was completed, unless otherwise specified.

b. Operators who have demonstrated a high degree SMS maturity and sustainability during a Stage Three audit may, upon recommendation by the auditor, be granted registration for a three-year period.

c. If a registration renewal audit is conducted within the 90-day period prior to expiry of the operator’s registration, the Certificate of Registration will be renewed for the full period from the original expiry date.

d. Registrations that have lapsed for more than six months will be treated as initial applications, unless an extension has been previously approved.

e. During the period Jan 1 to Jun 30 initial and renewal audits may be performed, at the discretion of the operator and the auditor, in accordance either with the standards of the previous year or the current year. However, after July 1 audits must be conducted in accordance with the current year standards.
2.0 Introduction

2.1 Need for IS-BAO

It is the role of the International Civil Aviation Organization (ICAO) to promote global harmonization of aviation safety standards. It is readily accepted that it is neither in the interest of safety nor the economic well-being of operators for variations in international standards to exist. Variations in safety standards can result in confusion and safety deficiencies and have imposed unnecessary financial burdens on operators. For example, unique aircraft equipment requirements can put operators at an economic disadvantage compared with operators in other States. This constrains the potential of the aviation community and the operation of individual organizations.

More importantly, the development and implementation of one common standard for aircraft operations will serve to enhance aviation safety and will provide the opportunity to implement modern best practices. Implementation of a common standard internationally will assist organizations in allocation of their resources to safety programmes having the most tangible benefits. It is for these reasons, the need to ensure safe aircraft operations and to encourage the growth and development of aviation that the IS-BAO has been developed.

A list of the benefits of IS-BAO is contained on the IBAC website at: http://www.ibac.org/is_bao/is-bao-benefits. In addition, a study completed by an independent safety analyst shows that the IS-BAO 'code of practice' has a considerable potential to reduce accidents. The analyst reviewed 297 accidents over a five year period and assessed them against the provisions of the safety standard to make a judgment regarding the potential that the accident would have been prevented if the organization had implemented the IS-BAO. To view the report see: http://www.ibac.org/Files/Safety/Woodhouse_Report_V11.pdf.

2.2 Linkage with International Standards

Implementation of the IS-BAO will also have secondary benefits for operators, as the IS-BAO framework is similar to other international standards systems. For example, an organization that wishes to be registered as compliant with the ISO 9000 Standards must document the procedures and processes it has adopted to ensure quality in all aspects of the organization’s operations, and must arrange to be audited by an accredited independent (third party) registrar organization. If the organization’s quality systems documentation and implementation are found to meet the requirements of the applicable ISO 9000 series standards, the registrar grants registration and lists the organization as an organization with certified quality systems. All purchasers of the organization’s products can accept the third party registration as evidence that the organization’s quality systems meet the applicable ISO 9000 series requirements.

Such third-party registration schemes provide a number of benefits. Registration demonstrates that an operator has implemented an adequate quality system for the products it offers or provides. By this, better internal commitment, as well as enhanced user confidence, may be achieved.

Many aircraft manufacturing and repair organizations and some flight operations have embarked on ISO registration to satisfy internal organization requirements and to facilitate marketing internationally. IS-BAO is designed to be specifically applicable to business aviation and to commercial and non-commercial helicopter operations and may be a beneficial aviation specific alternative to current generic standards, or perhaps as a first step before going to ISO registration.
Some civil aviation authorities have already adopted and tailored this philosophy and approach in their aviation safety regulatory frameworks. They have done this by requiring operators to establish and maintain safety management systems, the objective of which is to prevent accidents and incidents.

2.3 Safety Management Philosophy

While the IS-BAO has been developed primarily to establish a common international standard for business aircraft and helicopter operations, it has an operator's safety management systems as its cornerstone. An operator can use their SMS to identify hazards faced by their organization and to analyse the associated risks. The mitigation developed to eliminate the hazards or to manage the risks to an acceptable level should then be incorporated into the programs, systems, processes and procedures established to meet the requirements of the other twelve IS-BAO chapters. Through their safety assurance processes the operator then tracks these to ensure that they are appropriate and effective.

2.4 IS-BAO Structure

2.4.1 General

The IS-BAO is composed of a series of chapters that present the standards and recommended practices that have been derived from existing ICAO Standards and Recommended Practices (SARPS), national civil aviation regulations and business aircraft and helicopter association best practices. They are considered to be the norm of well-managed progressive business aviation flight departments or helicopter operators.

The chapters of the IS-BAO present the standards that the operators who choose to use the standard shall meet. The terms “shall” and “must” are used to indicate a standard that must be met, and the term “should” is used to indicate a recommended practice. The recommended practices, which are shown in italics, are also presented for the operator's consideration.

A comprehensive Safety Management System (SMS) Toolkit is available to facilitate development of that system.

The guidance material presented in the Implementation Guide (IG) was developed to assist operators in meeting the standards, but is not the only acceptable means of doing so. Operators are free to develop their individual means of compliance should they wish to do so. While the terms “shall” and “must” are used in the IG that is presented as examples of text that operators may use, it must be understood that this is advisory material.

Additional reference documents are listed or hyperlinked.

In addition, the HAI mission specific standards are available for helicopters. Operators should see the HAI web site at http://www.rotor.com/AboutHAI/ContactUs.aspx for further information on these standards.

2.4.2 Formatting

In the body of the document the standards are shown in normal type font and recommended practices are shown in italic type font. Document titles are also in italic type font. Sections that have been revised in this edition are marked with a sidebar.
2.5 Language of the Standard

As English is the accepted international language of aviation, and is by policy the language of the International Business Aviation Council, the IS-BAO is published in that language. The terminology and English language spelling used by ICAO has been used in this document.

2.6 Translation into Other Languages

National or regional associations that are members of IBAC or affiliates of IBAC members may, with the written permission of IBAC, translate the IS-BAO into their national language. In such cases they shall ensure accuracy of the translation and include a statement in the Preface that the "definitive" text for the IS-BAO is the English language version.

2.7 Implementation Considerations

2.7.1 Overview

The IS-BAO includes extensive guidance material that is designed to assist operators to integrate the standards into their operation. However, as the standards provide a comprehensive framework for managing the safety, security, efficiency and effectiveness of the entire operation, it must be understood that a degree of effort is required. The first thing that an operator should do is to review the IS-BAO and related documents in order to acquire a good understanding of them. When this has been achieved, an implementation plan can be developed and the work commenced. After implementation is completed operators may undergo an audit by an accredited IS-BAO Auditor and become registered as being in conformity with the IS-BAO standards.

Some operators have concluded that they did not have the time or resources to undertake implementation on their own and chose to engage an implementation support service organization to assist them. All of these considerations will be discussed in detail.

2.7.2 IS-BAO Standards

The IS-BAO standards themselves are contained in sections 3 through 15 of this document. These standards are largely performance based. That is, they describe “what” must be achieved, rather than “how” things must be done. This allows operators, including owner operators, to develop processes, procedures, systems, programs and manuals that are appropriate to their individual operation. In this context:

a. a **process** is a system of activities that uses resources to transform inputs into outputs,
b. a **procedure** is a series of steps followed in a methodical manner to complete an activity – what shall be done and by whom, when, where, and how it shall be completed; what materials, equipment, and documentation shall be used, and how it shall be controlled,
c. a **system** is a set of interrelated procedures, and
d. a **program** is a system with objectives and an implementation plan that is established to meet a specific need.

While the standards include most of the usual subjects addressed in similar standards, the one significant difference is the requirement for operators to develop a safety management system (SMS). An SMS is an evolution of the traditional flight safety program that incorporates some of the principles found in quality systems.
An International Standard for Business Aircraft Operations

Chapter 2.0

Introduction

The SMS is the cornerstone of the IS-BAO and the element that makes the other performance based standards effective. It must be understood that the SMS is not a stand-alone system - it is in fact intrinsically linked to all of the standards. It is a process where operators identify the hazards and associated safety-risks that are inherent in their individual operation and then develop appropriate strategies, to either eliminate the hazards or reduce the level of risk to an acceptable level. These strategies are then tracked to ensure that the mitigation is appropriate and effective. The tracking system also allows operators to identify latent or emerging safety-risks and deal with them before an occurrence. More information on the SMS concept is available on the IBAC web site at http://www.ibac.org/safety-management, in the SMS Toolkit and associated guidance material, the IHST SMS Toolkit at http://www.rotor.com/Safety/SafetyManagementSystemToolkits.aspx and the references cited in IG 3.2 of the IS-BAO.

While the IS-BAO standards are based on “best practices” initially derived from the approximately 100 flight departments that were involved in the development process, they are also structured to meet the standards and recommended practices established by ICAO in Annexes 1 Personnel Licensing, 6 Operation of Aircraft Part II International General Aviation – Aeroplanes and 6 Part III International Operations Helicopters, plus other related annexes and manuals. In several cases notations are made in the standards to provide for operators to choose to meet their national standards for operations within their domestic airspace. However, operators who chose to do so must be aware that they are required to meet the applicable international or State rules when operating outside of their domestic airspace.

2.7.3 Implementation Guidance Material

Guidance material in the IG is cross-referenced to the applicable standard. For example, the standard for safety management systems is contained in section 3.2. IG 3.2 then presents guidance material for the development of the operator’s safety management system. Additionally, IG 3.2 provides reference to the SMS Toolkit and other guidance material for developing a safety management system. In numerous instances, rather than reproduce material from other sources, it is referenced as guidance material. For example, in IG 6.1, several sources of guidance material for development of standard operating procedures are referenced.

As notable guidance material is identified, reference to it is included in the IS-BAO Newsletters. This information is sent via e-mail to all IS-BAO holders and is also posted on the IBAC web site at http://www.ibac.org/is_bao/newsletter.

Additional policy information is available on the IBAC website. Policy letters can be found through the following link: http://www.ibac.org/is_bao/policies.

2.7.4 Determining Implementation Strategy

Once an understanding of the IS-BAO system and related requirements has been developed the next step in the process is for the operator to determine:

a. what is already in place,

b. what processes, procedures, programs, systems and documentation need to be modified, and

c. what needs to be developed?

Experience has shown that many operators have a good percentage of the processes, procedures, systems, programs and documentation already in place. There may be a need to fine tune some, to make more extensive modification to some and to establish others. It must be stressed that a
basic concept of the IS-BAO is that the processes, procedures, systems, programs and documents must be appropriate to the nature of the individual operation. It is not desirable to develop ones that are more involved and complex than is necessary to manage the safety, security, efficiency and effectiveness of the operation. In fact, if they are unnecessarily complicated they probably will not be used and the potential benefits will be lost. On the other hand, if they are too rudimentary they probably will not be effective. Therefore, it is recommended that the “appropriateness” and “effectiveness” test be rigorously applied.

It is highly recommended that as many members of the organization or operation as possible, be involved in determining what is needed to implement the standard. It will help to create “buy-in” to the process and it also may be a way to identify latent talent within the organization that can be utilized in the implementation process. It is also very important to obtain senior management buy-in early in the process. Their support is essential to ensuring a smooth and successful implementation.

Some operators have found it valuable to also involve an accredited IS-BAO auditor in the gap analysis process. While it would be a conflict of interest for the auditor to provide consulting services and then audit their work, it is acceptable for the auditor to be involved during the implementation process and to make assessments of work, required, planned or underway, and to provide strategic guidance to assist operators with the implementation process. A list of accredited auditors is posted at http://www.ibac.org/is_bao/accredited-auditors.

Assistance in the assessment process and in developing the implementation strategy is also available from some of the implementation support service providers that are listed on the IBAC web site at http://www.ibac.org/is_bao/implementation-support.

At this point the operator should be in a position to estimate the effort and time required to complete IS-BAO implementation. The time required to complete the implementation process depends on the size and complexity of the operation, the maturity of the operator’s existing procedures, programs and manuals, and the extent that the operator needs, or chooses, to modify them and the level of resources dedicated to the project. Some operators have been able to complete the process in a few weeks and others have taken several months to a year.

Operators that conclude that they do not have the time or resources to undertake IS-BAO implementation on their own may choose to engage an implementation support service provider to assist them. A list of organizations or individuals that provide IS-BAO implementation support services is posted at http://www.ibac.org/is_bao/implementation-support. In accordance with IS-BAO Policy 2012-4 http://www.ibac.org/wp-content/uploads/2010/06/IS-BAO-Policy-2012-04.pdf, IBAC recognizes aviation support services organizations that have demonstrated knowledge of the IS-BAO and are in the business of providing services or products to aircraft operators. When conditions required under this Policy are satisfied, the recognized organization will be designated an “IS-BAO Support Services Affiliate” and IBAC includes its name on lists maintained on the IBAC website. Operators who use their services will be aware that the service provider has a basic understanding of the requirement of the IS-BAO as it pertains to the service or product being provided. If an operator choses the option to engage an implementation support service provider, it is very important to ensure that the operator continues to be fully engaged in the process.

Another important resource that is available is the Fundamentals of IS-BAO Workshop. IBAC regularly holds workshops that are designed to assist operators to implement the IS-BAO. The workshop schedule is posted at http://www.ibac.org/is_bao/is-bao-workshop-schedule. The workshops are a full day – 0800 to 1600 hrs. The workshop includes a discussion of:
a. the background, philosophy and benefits of the IS-BAO program,
b. the standards and recommended practices,
c. safety management systems (SMS) and the implementation process, and
d. the IS-BAO audit and registration process.

The workshop fee for operators and other interested parties is $500 US per person. A registration form may be downloaded at http://www.ibac.org/is_bao/is-bao-workshop-information-applications-and-fees/introduction-to-is-bao-workshop-applications-and-fees.

To assist operators with their SMS development many IBAC member associations present SMS Toolkit workshops. The workshops address the basics of safety management and safety management systems plus the use of the SMS Toolkit. More information on the SMS Toolkit workshops is available at http://www.ibac.org/safety-management/sms-toolkit/workshops or through IBAC member associations.

Two SMS eLearning courses are also available. See the following link: http://www.ibac.org/safety-management/sms-elearning-course.

2.7.5 The Implementation Process

Once the implementation strategy has been developed it is recommended that a more detailed plan with a time frame and milestones be developed. This will assist in maintaining focus and momentum. It is very important to maintain momentum particularly if there is a considerable level of effort required.

The usual first implementation step is to conduct an assessment of the hazards and the associated safety-risks that are inherent in the operation. The SMS Toolkit and the document Guidelines for the Conduct of Risk Analysis by Business Aircraft Operators that is on the IS-BAO CD, provide details on the process and related tools. Again, experience has shown that it is beneficial to involve as many of the flight department or flight operation staff members as possible in the process. Different perspectives add to the effectiveness of the process and should provide synergy.

Once the process of identifying the inherent hazards and associated safety-risks and developing appropriate mitigation strategies has been completed, the operator will have an enhanced framework to assist in developing, or modifying, their processes, procedures, systems, programs, and documents. It must be stressed that the “appropriateness” and “effectiveness” test should be applied. If many of the existing systems are paper based, do not try to mix in complex automated systems. On the other hand, if there is a high degree of automation in the operation, don’t mix in complex paper systems. Make sure that everything fits together in an integrated systematic manner and reflects the individual aspects of the operation.

In the implementation process operators are encouraged to make maximum use of the guidance material referenced in the IS-BAO standards and GMs. Use of this material should facilitate the process. Although a helicopter specific version has not been developed, one tool that may be helpful is the generic company operations manual (GCOM) that is on the IS-BAO CD. There are five different formats of the GCOM. The Regular version is the format that is most familiar in North America and the European version follows the format generally used in Europe. The Regular version is formatted in both 8 ½ x 11 and 5 ½ x 8 ½ size. The European version is formatted in A4 and 5 ½ x 8 ½. There also is a format structured for single pilot operations. Operators can chose to use the GCOM if they wish, or they can use any other format for their
company operations manual as long as it contains the required information. It is recognized that most regulatory authorities specify the content and structure of the operations manual used by operators engaged in commercial air transport operations. If another operations manual format is being used, it may be helpful to use the GCOM as a reference to help ensure that the required information is included. At the same time it must be stressed that the process, procedures, etc. must not be simply copies of guidance material. They must reflect the reality of the operation.

Note: The term “company operations manual” has been used as it is the term used for the related IS-BAO documents. Operators may use the any term they consider appropriate when referring to their operations manual.

Some operators have advised that the IS-BAO implementation process was a very effective team building exercise. They achieved this result by ensuring that there was full involvement of all personnel involved in the operation. If the use of a support service provider has been the chosen option, it is very important to ensure that the flight department/operation continues to be fully engaged in the process.

During the implementation process it may be advantageous to refer to the IS-BAO Internal Audit Manual that is on the IS-BAO CD. The IS-BAO Audit Protocol that is in the document is the same checklist that the IS-BAO auditor will use. Also, chapter 5 of that manual, Evaluating the Operator’s SMS, may be especially helpful in the SMS development process. As previously noted, an SMS Toolkit containing extensive references and examples is provided on the IS-BAO CD.

Because the IS-BAO is designed with ISO-9000 principles in mind, the operator should document ALL key safety-related processes in their organization, to include specific supporting procedures and process ownership for accountability.

2.7.6 Audit Preparation

When the implementation process is nearing completion arrangements should be made for a registration audit. When engaging the auditor it is recommended that agreement be reached on the scope of the audit and an audit plan.

The duration of the audit will depend on the size and complexity of the operation and the degree of preparedness. As part of the audit preparation process, well in advance of the audit, operators should provide the auditor with a filled-in copy of the IS-BAO Audit Protocol that identifies the location of each of the audit elements in the operator’s documents or systems, as well as copies of all relevant manuals. This should be discussed with the auditor. Essential information regarding IS-BAO audit procedures, SMS evaluation, and associated audit terminology is provided in the IS-BAO Internal Audit Manual located on the IS-BAO CD.

In the initial audit the auditor will be assessing the soundness and appropriateness of the operator’s SMS and all of the required processes, procedures, systems, programs, and documents. In subsequent registration renewal audits the auditor will be looking for evidence of effectiveness and continuous improvement. During the audit the auditor will review documents and interview people. Everyone’s cooperation will make the auditor’s task easier and should assist in maximizing the value of the audit.

IBAC maintains an audit quality assurance program that includes monitoring a percentage of the registration audits. The Monitors are either IBAC staff or persons designated by the IS-BAO.
Standards Board. The Monitors will only observe the audit and will not become involved in the audit process. Auditors and the operator will be advised in advance if an audit will be monitored.

When the audit has been successfully completed operators may apply to IBAC for Registration. A Registration Application Form is contained in Appendix B. A Renewal Application Form is contained in Appendix C.

Helicopter operators who have successfully completed the IBAC Registration process may apply for mission specific accreditation by the HAL. In addition to an IS-BAO audit, the accreditation process will include on site evaluation of helicopter mission specific criteria related to the type of operations conducted by the operator. Additional information on the helicopter mission specific standards and related processes is available at http://www.rotor.com/.

2.7.7 System Maintenance

The process of managing the safety, security, efficiency and effectiveness of a flight operation is a dynamic process. It is important the operator’s SMS and the IS-BAO elements are considered “living systems” that are fully integrated into day-to-day activities. Effective use of the operator’s SMS is a very powerful tool for enhancing the efficiency and effectiveness of the operation. It has the potential to provide benefits that exceed the costs associated with IS-BAO implementation.

Operators may desire to conduct internal audits to determine their preparedness for an IS-BAO registration audit, or as a means to assess the appropriateness and effectiveness of their safety management activities on an on-going basis. An internal audit program can be an effective element of continuous improvement through on-going safety management that is a key aspect of the IS-BAO. The IS-BAO Internal Audit Manual found on the IS-BAO CD can help in developing an internal audit program.

2.7.8 Keeping IS-BAO Current

These standards are revised annually to incorporate emerging international standards and industry best practices. However, many of the changes applied annually come from suggestions made by IS-BAO registrants and industry sources. Users are encouraged to submit recommended changes to the standard to is-bao@ibac.org. Recommended changes are reviewed by the IS-BAO Standards Board for acceptance and inclusion in the annual revision.

Revisions to the IS-BAO and related material are posted on a secure page of the IBAC web site in January each year. At that time an e-mail message will be sent to each recorded IS-BAO holder who has previously elected to receive an e-version of the revision, advising them that the amendments are available for download. Consequently, it is important that IS-BAO holders ensure that the IBAC office has the current name and e-mail address for the person responsible for custody of the IS-BAO in your organization. Such information should be sent to administration@ibac.org. Also, if you don’t receive an e-mail message by mid-January advising of the availability of the download of the amendments, please send a message to administration@ibac.org, identifying yourself as a standards holder who has not received the amendment information.
3.0 Safety Management Systems

3.1 General

While the following chapters provide specific standards for the structuring, staffing and operation of an aircraft operation, this chapter provides the framework and description of each element of the framework, for the implementation and maintenance of an overall safety management system. This framework is designed to assist the management of the organization and provide focus in the prime goal of providing safe and efficient air transportation.

3.2 Safety Management System Requirements

An SMS is a management system for the management of safety by an organization. The framework includes four components and twelve elements representing the minimum requirements for SMS implementation. Every aircraft operator must establish and maintain a safety management system appropriate to the size and complexity of the operation and that consists of the following four components and twelve elements:

3.2.1. Safety Policy and Objectives

a. Management commitment and responsibility

The organization shall define the organization’s safety policy, which shall be in accordance with international and national requirements, and which shall be signed by the accountable executive of the organization. The safety policy shall reflect organizational commitments regarding safety; include a clear statement about the provision of the necessary resources for the implementation of the safety policy; and be communicated, with visible endorsement, throughout the organization.

The safety policy shall include the safety reporting procedures; clearly indicate which types of operational behaviours are unacceptable, and include the conditions under which exemption from disciplinary action would be applicable. The safety policy shall be periodically reviewed to ensure it remains relevant and appropriate to the organization.

b. Safety accountabilities

The organization shall identify the accountable executive who, irrespective of other functions, has ultimate responsibility and accountability, on behalf of the organization, for the implementation and maintenance of the SMS. The organization shall also identify the accountabilities of all members of management, irrespective of other functions, as well as of employees, with respect to safety performance of the SMS. Safety responsibilities, accountabilities and authorities shall be documented and communicated throughout the organization and shall include a definition of the levels of management with authority to make decisions regarding safety risk tolerability.

c. Appointment of key safety personnel

The organization shall identify a safety manager to be the responsible individual and focal point for implementation and maintenance of an effective SMS.

Note: In a small operation the manager of the organization would be this individual.
d. Coordination of emergency response planning

The organization shall ensure that an emergency response plan that provides for the orderly and
efficient transition from normal to emergency operations, and the return to normal operations, is
properly coordinated with the emergency response plans of those organizations it must interface
with during the provision of its services.

e. SMS documentation

The organization shall develop an SMS implementation plan, endorsed by senior management of
the organization, that defines the organization’s approach to the management of safety in a manner
that meets the organization’s safety objectives and maintain SMS documentation to describe the
safety policy and objectives, the SMS requirements, the SMS processes and procedures, the
accountabilities, responsibilities and authorities for processes and procedures, and the SMS outputs.
Also as part of the SMS documentation, the organization shall develop and maintain a safety
management system manual (SMSM), to communicate its approach to the management of safety
throughout the organization.

Note: The SMSM may be a chapter in the operations manual.

3.2.2. Safety Risk Management

a. Hazard identification

The organization shall develop and maintain a formal process that ensures that hazards in
operations are identified. Hazard identification shall be based on a combination of reactive,
proactive and predictive methods of safety data collection.

b. Safety risk assessment and mitigation

The organization shall develop and maintain a formal process that ensures analysis, assessment and
control of the safety risks in operations.

3.2.3. Safety Assurance

a. Safety performance monitoring and measurement

The organization shall develop and maintain the means to verify the safety performance of the
organization and to validate the effectiveness of safety risks controls. The safety performance of
the organization shall be verified in reference to the safety performance indicators and safety
performance targets of the SMS.

Note: The safety performance monitoring and measurement process should include an internal
evaluation or audit program that assesses the performance of the SMS in relation to the
stated safety objectives and ensures both the effective management of safety risks and a
positive safety culture. Information on internal evaluation and audit, to include Cultural
Assessment Tools, is contained in the SMS Toolkit and the IS-BAO Internal Audit Manual.

b. The management of change

The organization shall develop and maintain a formal process to identify changes within the
organization which may affect established processes and services, to describe the arrangements to
ensure safety performance before implementing changes and to eliminate or modify safety risk controls that are no longer needed or effective due to changes in the operational environment.

c. Continuous improvement of the SMS

The organization shall develop and maintain a formal process to identify the causes of sub-standard performance of the SMS, determine the implications of sub-standard performance of the SMS in operations, and eliminate or mitigate such causes.

3.2.4. Safety Promotion

a. Training and education

The organization shall develop and maintain a safety training programme that ensures that personnel are trained and competent to perform their SMS related duties. The scope of the safety training shall be appropriate to each individual’s involvement in the SMS.

b. Safety communication

The organization shall develop and maintain formal means for safety communication that ensures that all personnel are fully aware of the SMS; conveys safety critical information; and explains why particular safety actions are taken and why safety procedures are introduced or changed.

Note: IG 3.2 and the SMS Toolkit (included with the IS-BAO) contain guidance material to assist with the development and implementation of a SMS.

3.3 Compliance Monitoring

3.3.1 Each aircraft operator must establish and maintain a system for identifying applicable regulations, standards, approvals and exemptions and demonstrating compliance with them.

Note 1: As the IS-BAO has been developed to meet the requirements of ICAO Annex 6 Part II Operation of Aircraft – International General Aviation – Aeroplanes and Annex Part III Section III Operation of Aircraft – International General Aviation – Helicopters, such compliance monitoring is important for operators conducting commercial operations and for operators where the rules of the State of Registry may contain provisions that are more demanding than Annex 6 Part II.

Note 2: Guidance material on compliance monitoring systems in contained in the SMS Toolkit.

3.4 Flight Data Analysis

3.4.1 It is recommended that operators establish and maintain a flight data analysis programme as part of a safety management system.

Note: Flight data analysis programs are also known as corporate flight operational quality assurance (C-FOQA) programs.

3.5 Reserved
4.0 Organization and Personnel Requirements

4.1 Organization and Personnel

4.1.1 An organization shall be staffed by qualified, competent and effective management and line personnel to ensure the safe and efficient operation of the organization. An operator shall have an organization structure that clearly defines qualifications, duties, authorities and accountabilities and that is staffed by qualified managerial and operating personnel who are capable of effectively carrying out the identified duties. The minimum management personnel are:

a. a person having overall management responsibilities for the flight operation (such as a “Flight Department Manager” or “Director of Operations”),
b. a person responsible for managing the flying operations (such as a “Chief Pilot”), and
c. a person responsible for managing aircraft maintenance.

In the case of a small operation one person may occupy, or perform the functions of, two or more of the positions.

Note: While the ICAO definition of maintenance includes both the performance of maintenance and the tasks required to ensure the continuing airworthiness of an aircraft the European rules differentiate between the two activities. Hence, for operators of large aeroplanes (maximum certificated take-off mass in excess of 5 700 kg or multi-engine helicopters), or any aircraft performing commercial air transport or aerial work who fall under EASA rules, the organisation may need to be approved for the maintenance (MRO) and continuing airworthiness management (CAMO) or may contract such approved organisations under certain conditions.

4.1.2 Where the organization has more than one operating base the management structure must address the exercise of the above responsibilities at all locations.

Note: IG 4.1 contains a recommended organization structure and the associated duties and responsibilities for management personnel. The IG also includes responsibilities and qualifications for a safety officer.

4.2 Aircraft Crew Member Duties and Responsibilities

4.2.1 The minimum aircraft crew shall consist of the number of qualified flight crew as specified in the aircraft flight manual or other documents associated with the certificate of airworthiness. The minimum number of cabin crew members shall be in accordance with national requirements.

4.2.2 An operator shall designate a pilot-in-command for each flight and, where the crew includes two pilots, a second-in-command.

4.2.3 The pilot-in-command shall be responsible for the operation, safety and security of the aircraft and the safety of all crew members, passengers and cargo on board. Specific duties and responsibilities shall include:

a. ensuring that a flight will not be commenced if a flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue, or the effects of any psychoactive substance,
b. ensuring that the flight will not be continued beyond the nearest suitable aerodrome or heliport\(^1\), when a flight crew member’s capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness or lack of oxygen,

c. responsibility for operational control. An operator shall describe the operational control system in the operations manual and identify the roles and responsibilities of those involved with the system,

d. responsibility for the security of the aircraft during its operation,

e. checking and assessing weather and all applicable NOTAMs where available,

f. determining fuel, oil and oxygen requirements,

g. determining the aircraft weight/mass and balance limits,

h. ensuring that all flight planning requirements have been met,

i. ensuring that the aircraft is airworthy, duly registered and that the documentation and operational information specified in section 8.3.1 are onboard the aircraft.

j. completing an aircraft pre-flight inspection as per the aircraft flight manual, before each departure,

k. briefing the passengers in accordance with the requirements specified in section 6.11,

l. operating the aircraft in accordance with operator procedures and aircraft limitations,

m. completing all post flight duties as specified in the company operations manual, recording flight times and aircraft defects,

n. notifying the nearest appropriate authority by the quickest available means of any accident involving the aircraft, resulting in serious injury or death of any person or substantial damage to the aircraft or property,

o. ensuring that a suspected communicable disease is reported promptly to air traffic control, in order to facilitate provision for the presence of any special medical personnel and equipment necessary for the management of public health risks on arrival,

p. submitting a report to the designated local authority following an act of unlawful interference,

q. completing the journey log book or the general declaration, and

Note: By virtue of Resolution A10-36 of the Tenth Session of the Assembly (Caracas, June–July 1956) “the General Declaration, [described in Annex 9] when prepared so as to contain all the information required by Article 34 [of the Convention on International Civil Aviation] with respect to the journey log book, may be considered to be an acceptable form of journey log book”.

r. as soon as possible, report to the appropriate air traffic services (ATS) unit any hazardous weather or flight conditions encountered that are likely to affect the safety of other aircraft.

4.2.4 The second-in-command, when required, reports to the pilot-in-command and will carry out any duties delegated by that person.

4.2.5 Cabin crew and other crew members assigned to perform duties onboard, are responsible to the pilot-in-command to carry out specified safety duties in the event of an onboard emergency. The requirement for cabin crew for each type of aircraft shall be determined by the operator, and in accordance with national regulations, based on seating capacity or the number of passengers carried, in order to effect a safe and expeditious evacuation of the aircraft, and the necessary

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\(^1\) Heliports may include temporary landing sites or operating areas.
functions to be performed in an emergency or a situation requiring emergency evacuation. The operator shall assign these functions for each type of aircraft.

4.3  **Crew Member Qualification**

4.3.1  An operator shall ensure that:
   a. the flight crew of an aircraft:
      i. holds the licence, medical certificate and ratings (including radiotelephony licence unless it is included in the pilot licence) required by national regulations,
      ii. meets all recency requirements of the national regulations,
      iii. meets the licence, medical and rating requirements specified in *ICAO Annex 1* when operations are conducted outside of the national airspace of the State of issue of the flight crew licence,
      iv. has fulfilled the requirements of the operator's ground and flight training programme referred to in sections 5.1, 5.2, 5.3 and 5.4,
      v. have successfully completed the proficiency requirements specified in section 5.5 for that type of aircraft, and
      vi. can demonstrate the capability to speak and understand the language used for aeronautical radiotelephony communications as specified in *ICAO Annex 1*;
   b. each cabin crew member has fulfilled the requirements of the national regulations and the operator's ground and flight training programme referred to in sections 5.1, 5.2 and 5.3, and recommended in section 5.4; and
   c. each crew member or task specialist, other than a flight crew member or a cabin crew member, who is assigned duties onboard an aircraft during flight time has fulfilled the requirements of the operator's ground and flight training programme referred to in section 5.1.

4.3.2.A  *It is recommended that where it is the operator’s practice to normally fly two crew aeroplanes from the left seat, that the operator establish right seat landing and take-off recency/training and recency requirement for pilots.*

4.3.2.H  *It is recommended that where it is the operator’s practice to normally fly two crew helicopters from the right seat, that the operator establish left seat landing and take-off recency/training and recency requirement for pilots.*

4.4  **Maintenance Personnel Qualifications**

4.4.1  Aircraft maintenance personnel shall hold a licence and ratings as specified in the State of Registry or State of Operator’s regulations that are appropriate for the aircraft on which the person does work. Other qualifications and recency requirements are contained in Chapter 9.0, Aircraft Maintenance Requirements and IG 9.1. Training requirements are contained in Chapter 5.0, Training and Proficiency.

4.5  **Other Personnel**

4.5.1  Depending on the size and functions, a number of other personnel specialities may be required to ensure the proper performance of the organization. These specialities may include flight operations schedulers or dispatchers, helicopter ground support personnel, security personnel, administrative personnel, hangar maintenance and line service personnel. Additionally, the
operation may include personnel (medical providers, operators of specialized equipment, news reporters, etc.) that are not employees of the operator but perform duties that are essential to the operation. The duties, authorities, and responsibilities for other personnel shall be described within the company operations manual. Sample descriptions of some of these specialities may be found in IG 4.1. All personnel shall be trained commensurate with their duties and responsibilities.

4.6 Use of Psychoactive Substances

4.6.1 It is recommended that operators develop policies on the use of psychoactive substances to ensure that holders of licences do not exercise the privileges of their licences and other personnel do not undertake safety related duties while under the influence of any psychoactive substance which might render them unable to safely and properly exercise their licence privileges or carry out their safety related duties.

4.6.2 It is recommended that these policies also address any problematic use of substances.

Note: Psychoactive substances include alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

4.7 Mobile Phones and other Portable Electronic Devices (PED)

It is recommended that the operator provide guidance on the use of mobile phones and PED for all personnel, including critical phases of flight and ground operations, operating vehicles, and maintenance work.

4.8 Fatigue Risk Management Program

The operator should develop and maintain a program to assess and manage the inherent risks associated fatigue for all personnel. The program should include all the elements as required for aircrew members and maintenance personnel as described in Section 6.13.

(Recommended Practice)
5.0 Training and Proficiency

5.1 Training Programmes

5.1.1 Crew members must maintain a level of proficiency that will ensure their ability to operate the aircraft and cope with emergency situations. The operator shall establish and maintain a training programme that is designed to ensure that a person who receives training acquires the competence to perform their assigned duties. The training program shall include initial and recurrent training and include all equipment installed on the aircraft that the crew member flies.

*Note: Additional guidance material on development of training and proficiency programs is contained in IG 5.1. Also, the NBAA Prototypical Business Aviation Safety Program Manual and related attachments that can be found at [http://web.nbaa.org/public/ops/safety/manual](http://web.nbaa.org/public/ops/safety/manual) may provide operators with assistance.*

5.1.2 An operator shall ensure that ground and flight training programmes have been established, either through an internal programme or through a training service provider, and shall include or make reference to, a course outline for those training programmes in its operations manual.

5.1.3 The operator's ground and flight training programme shall include:

a. for flight crew members:
   i. initial and annual aircraft type and systems training including emergency and abnormal procedures related to the aircraft category and type,
   ii. initial and every two years thereafter:
      A. emergency procedures training, (see section 5.3.1)
      B. aircraft surface contamination training, and
      C. dangerous goods training, (see section 14.1.3)
   iii. upgrading training, and
   iv. *it is recommended that operators that do not use cabin crew members provide periodic first aid training for flight crew member;*

b. for cabin crew members:
   i. initial and annual training, including:
      A. aircraft type training, and
      B. safety procedures training, (see section 5.3.2), and
   ii. initial and every two years thereafter:
      A. emergency procedures training, (see section 5.3.1)
      B. first aid training,
      C. aircraft surface contamination training, and
      D. dangerous goods training; (see section 14.1.3)

c. initial and recurrent training for other personnel and task specialists (such as loadmasters, stewards, HEMS medical teams, observers, etc.) who are assigned to perform duties on board an aircraft during flight time or provide operational ground support;
d. initial and recurrent training for schedulers and dispatchers; and

e. any other training required to ensure a safe operation.

*Note:* Such training, as applicable to the individual operation, may include:

- CAT II and CAT III operations,
- RVSM, MNPS, RNP operations,
- MEL procedures,
- aircraft upset recovery, (Note - This can be done in most modern flight simulators),
- dynamic rollover, loss of tail rotor effectiveness and vortex ring for helicopters,
- specialized mission training where applicable,
- international airspace operations,
- aircraft servicing and ground handling,
- EFIS, FMS, ACAS and HGS,
- signalling procedures for aircraft marshalls, and
- items included in 5.1.6.d.

5.1.4 No emergency or abnormal situations shall be simulated during flight when passengers are being carried.

5.1.5 *It is recommended that flight simulators be used for flight training to the maximum degree practicable. Industry best practices are to use flight simulators for initial and annual recurrent training.*

5.1.6 Maintenance Personnel Training Program

a. An operator shall establish and maintain training programmes that are designed to ensure that all maintenance personnel have the competencies appropriate to the levels of maintenance performed and the frequency with which the maintenance is performed.

b. An operator shall ensure that the training programmes have been established, either through an internal programme, an aircraft manufacturer or a training service provider, and include or make reference in the Company Operations Manual to a training course outline for those training programmes.

c. The training programme shall include initial and recurrent training appropriate to the aircraft group, type or system for which a maintenance release is to be signed and the operator’s maintenance procedures.

d. *The training programme should include other subjects such as:*

i. operator policies and procedures;
ii. computer skills and software applications used by the organization;
iii. interpersonal skills;
iv. human factors or crew resource management;
v. leadership and teamwork;
vi. HAZMAT;
vn. MEL procedures;
viii. safety procedures, and
ix. safety risk management.
e. It is recommended that persons who hold maintenance release authority undertake recurrent training at least every two years on any aircraft group, type or system for which they exercise that authority.

5.2 Crew Resource Management/Human Factors Training

5.2.1 "Human Factors" are always decisive wherever people perform highly responsible tasks in a high-tech setting. Crew resource management (CRM) training is a proven human factors tool for aviation personnel. Aircraft crew members shall be trained in, understand, and apply CRM because it is widely accepted that these principles improve the safety and efficiency of flight operations.

5.2.2 It is recommended that schedulers, dispatchers, maintenance personnel and all others connected with the operation receive CRM or Human Factors training and that recurrent training be provided periodically for all personnel.

Information on CRM and Human Factors training can be found in
a. FAA Advisory Circular 120-51E Crew Resource Management Training,
b. ICAO Circular Human Factors Digest No. 2, Flight Crew Training: Cockpit Resource Management (CRM) and Line Oriented Flight Training (LOFT),
c. ICAO Human Factors Training Manual (Doc 9683)
d. SKYbrary at http://www.skybrary.aero/index.php/Portal:Human_Factors,
e. UK CAA Publications CAP 716, CAP 720 and CAP 737, and
f. UK CAA paper 2003/1 Helicopter Tail Rotor Failure (for the Helicopter community).

5.3 Emergency and Safety Procedures Training

5.3.1 Emergency procedures training is required for all aircraft crew members and shall include instruction on the location and operation of all emergency equipment. During initial training and every two years thereafter, aircraft crew members shall perform the function or action, or obtain a suitable demonstration by other means e.g. audio-visual, for the following:

a. fire in the air and on the ground;
b. use of fire extinguishers;
c. operation and use of emergency exits;
d. passenger preparation for an emergency landing/ditching;
e. emergency evacuation procedures;
f. donning and inflation of life preservers (when equipped);
g. removal from stowage, deployment, inflation and boarding of life rafts (when equipped);
h. pilot incapacitation;
i. unlawful interference, bomb threat and other security procedures;
j. special emergency procedures should the aircraft have to be used for MEDEVAC operations including transportation of ill or injured passengers in emergency situations; and
k. passenger health emergencies.

5.3.1.1 It is recommended, particularly for aircraft without cabin attendants, that passengers that fly frequently receive emergency procedures training.
5.3.2 Safety procedures training is required for all cabin crew members during initial training and annually thereafter. This training shall include:
   a. authority of the pilot-in-command;
   b. means of communication;
   c. knowledge of the relationship of the procedures with respect to those of the other crew members;
   d. a general description of the aircraft in which the person is to serve and the proper use of cabin installed systems controls;
   e. safety procedures training for the handling of normal and abnormal situations including:
      i. safe movement in the vicinity of the aircraft and safe movement to and from the aircraft;
      ii. briefing of passengers;
      iii. handling of passengers;
      iv. securing of cabin;
      v. location, operation and use of emergency, lifesaving, first aid and survival equipment carried;
      vi. location of fire extinguishers;
      vii. decompression; and
      viii. location, operation and use of emergency exits.

Note: It is recommended that CPR training be included into first aid training when possible.

5.3.3H It is recommended that helicopter underwater escape training (HUET) be provided to personnel involved in over water helicopter operations in hostile environmental conditions.

5.4 High Altitude Training

5.4.1 High altitude training is required for all flight crew members operating aircraft above 10,000 ft. ASL and is recommended for other crew members. It shall cover at least the following:
   a. physiological phenomena in a low pressure environment, including:
      i. respiration,
      ii. hypoxia,
      iii. duration of consciousness at altitude without supplemental oxygen, and
      iv. gas expansion and gas bubble formation; and
   b. for pressurized aircraft phenomena associated with rapid or explosive loss of pressurization including:
      i. most likely causes,
      ii. noise,
      iii. cabin temperature change,
      iv. cabin fogging,
      v. effects on objects located near the point of fuselage failure, and
      vi. actions of flight crew members immediately following the event and the likely resultant attitude.

5.4.2 It is recommended that high altitude training items that are pertinent to the aircraft type be covered during initial aircraft type training.
Note: While the specified requirements do not include altitude chamber training, it is recognized that it is very beneficial to pilots in assisting them to understand their individual symptoms of hypoxia and the physiological impact of sudden decompression. Altitude chamber training is available from a variety of sources such as flight training schools, military establishments or hospitals, and it is encouraged early in the career of business aviation pilots.

Note: Hypoxia awareness training is also available from training service providers through the use of mixed gas devices, or through normobaric technology that simulates an oxygen deficient environment.

5.5 Proficiency Certification

5.5.1 National civil aviation regulations vary in the requirements and processes for proficiency certification for aircraft crew members. Operators must ensure that personnel meet national proficiency requirements and shall have processes to ensure that the training objectives for all crewmember training courses required by the national civil aviation authority are met.

5.5.2 The chief pilot is responsible for the proficiency of pilots and for ensuring that the proficiency is certified through a pilot proficiency check (PPC) conducted:
   a. at the conclusion of initial aircraft type training, and
   b. at a minimum of every 24 calendar months thereafter.

5.5.3 Such pilot proficiency checks shall be conducted by:
   a. an approved national civil aviation pilot examiner, e.g. Type Rating Testing Officer,
   b. a company check pilot approved or designated, by the State civil aviation authority,
   c. a pilot examiner that holds approval authority from an ICAO Contracting State, or
   d. the chief pilot.

Pilot proficiency may also be certified by training to proficiency using the same standard.

Note: Most States have specific test standards for conducting pilot proficiency checks. In the absence of specific test standards, a range of practical test standards that operators may use to conduct a PPC or for training to proficiency can be downloaded from the following civil aviation authority web sites:

- http://www.faa.gov/training_testing/testing/airmen/test_standards/pilot
- http://www.caa.co.uk/application.aspx?catid=33&pagetype=65&appid=11&mode=list&type=sercat&id=22

5.6 Training and Qualification Records

5.6.1 An operator shall meet the national requirements for training records and at least for each person who is required to receive training, establish and maintain a record of:
   a. the person's name and, where applicable, personnel licence number, type and ratings;
   b. if applicable, the person's medical category and the expiry date of that category;
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Business Aircraft Operations  
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c. the dates on which the person successfully completed any required training, pilot proficiency check or examination;

d. information relating to any failure of the person to successfully complete any required training, pilot proficiency check or to obtain any required qualification; and

e. the type of aircraft or flight training equipment used for any training, pilot proficiency check or required qualification.

5.6.2 An operator shall retain these records and copies of pilot proficiency checks, or ensure that they are retained by the training service provider, for at least three years. The results of the most recent written examination completed by each pilot for each type of aircraft for which the pilot has a qualification shall also be retained.

Note: Given technological capabilities, electronic records for training, as well as other purposes, may be most effective. In such cases, operators may wish to consider procedures to protect their integrity and make them verifiable.
6.0 Flight Operations

6.1 Standard Operating Procedures

6.1.1 Standard operating procedures (SOPs) are the foundation of effective crew coordination and a key component of crew resource management and threat and error management (CRM/TEM).

a. Accordingly, operators of aircraft with two or more crew members shall establish and maintain a SOP for each type of aircraft operated that enable the crew members to operate the aircraft effectively and within the limitations specified in the aircraft flight manual.

b. It is recommended that operators of single pilot aircraft establish and maintain an SOP for each type of aircraft operated that enables the pilot to operate the aircraft effectively and within the limitations specified in the aircraft flight manual.

Note 1: The Single Pilot Supplement that is contained in Appendix A recommends SOPs for single pilot aircraft.

Note 2: SOPs are also included in the helicopter specific mission standards.

6.1.2 An operator that has established SOPs for an aircraft shall ensure that all crew members are trained in their use and that they are used by the crew members.

6.1.3 A copy of the SOP shall be issued to each aircraft crewmember.

6.1.4 A copy of the SOP shall be carried on board the aircraft when it is operated more than 25 nm from home base.

Note 1: IG 6.1 provides an acceptable means of conformance with this standard. Also, the NBAA PROTOTYPICAL Business Aviation Safety Program Manual contains comprehensive guidance material on standard operating procedures for both fixed and rotary wing aircraft. It can be found in the NBAA website at http://web.nbaa.org/public/ops/safety/manual/.

Note 2: The HAI has produced mission specific standards that include SOPs. Information on these mission specific standards can be found at: http://www.rotor.com/.

Note 3: Runway incursions have sometimes led to serious accidents with significant loss of life. Although they are not a new problem, runway incursions have been on the rise along with increasing air traffic. This issue is addressed in ICAO Doc 9870 Manual for Preventing Runway Incursions and excerpts from the Manual are contained in IG 6.1. Operators are encouraged to incorporate runway incursion prevention procedures in their SOPs.

6.2 Flight Planning and Pre-Flight Requirements

6.2.1 General

6.2.1.1 Before commencing a flight or series of flights, the pilot-in-command of an aircraft shall be familiar with the available flight information that is appropriate to the intended flight. The pilot-in-command shall not commence a flight unless it has been ascertained that the facilities available and directly required for such flight and for the safe operation of the aircraft are adequate, including communication facilities and navigation aids.
Note: Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS, Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS, Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.

6.2.1.2 Before commencing a flight or series of flights, the pilot-in-command shall be familiar with all available meteorological information appropriate to the intended flight. Preparation for every flight shall include:
   a. a review of available current weather reports and forecasts; and
   b. the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

6.2.2 VFR Flight

A flight, to be conducted in accordance with visual flight rules shall not be commenced unless available weather information indicates that the meteorological conditions along the route, or that part of the route to be flown under the visual flight rules, will permit flight under visual flight rules.

Note: When operations include high performance aircraft, consideration should be given to weather minima, VFR charts, training, routes, traffic, etc.

6.2.3 IFR Flight

The operator shall establish procedures to ensure that:
   a. A flight to be conducted in accordance with the instrument flight rules shall not be commenced unless the available information indicates that conditions, at the aerodrome or heliport, of intended landing or at least one destination alternate will, at the estimated time of arrival, be at or above the aerodrome or heliport, operating minima.
   b. A take-off alternate aerodrome/heliport shall be selected and specified in the flight plan if the weather conditions at the aerodrome/heliport of departure are at or below the applicable operating minima or it would not be possible to return to the point of departure for other reasons.
   c. For an aerodrome/heliport to be selected as a take-off alternate the available information shall indicate that, at the estimated time of use, the conditions will be at or above the applicable operating minima for that operation.

6.2.4 Destination Alternate Aerodrome

For a flight to be conducted in accordance with the instrument flight rules, at least one destination alternate aerodrome or heliport, shall be selected and specified in the flight plan, unless:
   a. the duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the aerodrome or heliport, of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions; or
   b. the aerodrome or heliport, of intended landing is isolated and there is no suitable destination

1 Heliports may include temporary landing sites or operating areas.
alternate aerodrome; and.

i. an instrument approach procedure is prescribed for the aerodrome or heliport, of intended landing; and

ii. available current meteorological information indicates that the following meteorological conditions will exist from two hours before to two hours after the estimated time of arrival:

A. a cloud base of at least 300 m (1,000 ft) above the minimum associated with the instrument approach procedure, and

B. visibility of at least 5.5 km (3 miles) or of 4 km (2 miles) more than the minimum associated with the procedure, whichever is greater.

6.2.5A Fuel Requirements (aeroplanes)

An operator shall establish policies and procedures to ensure that the following fuel requirements are met and in-flight fuel checks and fuel management are performed.

a. An IFR flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the aeroplane carries sufficient fuel to ensure that it can safely complete the flight and land with the planned final reserve fuel. The final reserve fuel shall allow for:

i. when no alternate aerodrome is required, to fly to the destination aerodrome and thereafter for a period of 45 minutes at normal cruising altitude, or

ii. when an alternate aerodrome is required, to fly to the destination aerodrome, then to the alternate aerodrome and thereafter for a period of 45 minutes at normal cruising altitude.

b. It is recommended that operators determine one final reserve fuel value for each aeroplane type and variant in their fleet rounded up to an easily recalled figure. *(Recommended Practice)*

c. The pilot-in-command shall continually ensure that the amount of usable fuel remaining on board is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining upon landing.

d. The pilot-in-command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than planned final reserve fuel.

e. The pilot-in-command shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

Note: Specific State requirements may vary in the application of this requirement. Operators must meet the specific requirements of the State of Registry and the State in which the operation is being conducted.

6.2.5H Fuel and Oil Supply Requirements (helicopters)

6.2.5.1 A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight. In addition, a reserve shall be carried to provide for contingencies.
6.2.5.2 **VFR operations.** The fuel and oil carried in order to comply with 6.2.6.1 shall, in the case of VFR operations, be at least the amount sufficient to allow the helicopter:

- a. to fly to the heliport to which the flight is planned;
- b. to fly thereafter for a period of 20 minutes at best-range speed; and
- c. to have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the State of the Operator.

6.2.6.1 **IFR operations.** The fuel and oil carried in order to comply with 6.2.6.1 shall, in the case of IFR operations, be at least the amount sufficient to allow the helicopter:

- a. When an alternate is not required, to fly to the heliport to which the flight is planned, and thereafter:
  - i. to fly 30 minutes at holding speed at 450 m (1 500 ft) above the destination heliport under standard temperature conditions and approach and land; and
  - ii. to have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of potential contingencies.
- b. When an alternate is required, to fly to and execute an approach, and a missed approach, at the heliport to which the flight is planned, and thereafter:
  - i. to fly to the alternate specified in the flight plan; and then
  - ii. to fly for 30 minutes at holding speed at 450 m (1 500 ft) above the alternate under standard temperature conditions, and approach and land; and
  - iii. to have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of potential contingencies.
- c. When no alternate is required, sufficient fuel shall be carried to enable the helicopter to fly to the destination to which the flight is planned and thereafter for a period that will, based on geographic and environmental considerations, enable a safe landing to be made.
- d. In computing the fuel and oil required in 6.2.6.1 at least the following shall be considered:
  - i. meteorological conditions forecast;
  - ii. expected air traffic control routings and traffic delays;
  - iii. for IFR flight, one instrument approach at the destination heliport, including a missed approach;
  - iv. the procedures prescribed in the operations manual for loss of pressurization, where applicable, or failure of one engine while en route; and
  - v. any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

*Note: Specific State requirements may vary in the application of this requirement. Operators must meet the specific requirements of the State of Registry and the State in which the operation is being conducted.*

6.2.6 **Oxygen Supply Requirements**

The operator shall have a procedure to ensure that a flight is not commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all crew members and passengers in accordance with the national regulations of the State of Registry.
6.2.7A  **Extended Diversion Time Operations (EDTO)**

*It is recommended that operators of turbine powered multi-engine airplanes used in extended diversion time operations (EDTO) over water or Polar regions, develop operational and maintenance procedures for those operations. Extended diversion time operations are described in ICAO Annex 6 Part I, Section 4.*

*Note: See AC 120-42B (Part 121) and AC 135.42 (part 135) for information published by the FAA on extended range operations.*

6.2.8  **Aircraft Performance**

In applying the Standards of this section, account shall be taken of all factors that significantly affect the performance of the aircraft (such as: mass, operating procedures, the pressure altitude appropriate to the elevation of the aerodrome or heliport, temperature, wind and considerations such as:

a. for landplanes - runway gradient and condition of runway, i.e. presence of slush, water and/or ice,

b. for seaplanes - water surface condition, and

c. for helicopters sand, gravel, snow or ice on the operating surface.

Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the aircraft is being operated.

6.2.8.1  **Aircraft** shall be operated in compliance with the terms of its certificate of airworthiness and within the approved operating limitations contained in its flight manual.

6.2.8.2  **The pilot-in-command** shall determine that aircraft performance will permit the take-off and departure to be carried out safely.

6.2.8.3A  **Aeroplanes -** All multi-engine turbojet-powered aeroplanes or those with a maximum takeoff mass exceeding 5 700 kg. shall conform to the following standards:

a. **Take-off.** The aeroplane shall be able, in the event of a critical power-unit failing at any point in the take-off, either to discontinue the take-off and stop within either the accelerate-stop distance available or the runway available, or to continue the take-off and clear all obstacles along the flight path by an adequate margin until the aeroplane is in a position to comply with 6.2.8.3.b.

*Note - “An adequate margin” referred to in this provision is illustrated by examples included in Attachment C to ICAO Annex 6, Part I.*

i. In determining the length of the runway available, account shall be taken of the loss, if any, of runway length due to alignment of the aeroplane prior to take-off.

b. **En route - one power-unit inoperative.** The aeroplane shall be able, in the event of the critical engine becoming inoperative at any point along the route or planned diversions from, to continue the flight to an aerodrome at which the Standard of 6.2.8.3.c. can be met, without flying below the minimum obstacle clearance altitude at any point.

c. **Landing.** The aeroplane shall, at the aerodrome of intended landing and at any alternate aerodrome, after clearing all obstacles in the approach path by a safe margin, be able to land,
with assurance that it can come to a stop or, for a seaplane, to a satisfactorily low speed, within the landing distance available. Allowance shall be made for expected variations in the approach and landing techniques, if such allowance has not been made in the scheduling of performance data.

**6.2.8.4H Single Engine Helicopters** – An operator shall develop procedures to ensure that:

a. The risks related to potential power plant failures during take-off and while enroute and landing are mitigated to an acceptable level by careful and continuous planning on the part of the pilot.

b. Takeoff considerations include selecting multiple rejected take-off areas if possible.

c. Enroute and landing considerations include vigilance at all times for forced landing areas in the event of a power plant failure.

d. For operations across water any additional hazards are identified and the associated risks are managed.

**6.2.8.5H Multi Engine Helicopters** – An operator shall develop procedures to ensure that operations are conducted in accordance with the Category A or B requirements specified in ICAO Annex 6 Part III as appropriate, and that considerations are applied so as to achieve a safe and successful outcome to a critical power plant failure in the takeoff, enroute and landing phases.

**6.2.9 Refuelling with Passengers On Board**

An operator shall develop procedures to ensure that aircraft are not refuelled when passengers are embarking, on board or disembarking unless:

a. all fuelling safety procedures are complied with,

b. the aircraft is attended by qualified personnel ready to initiate and direct an evacuation of the aircraft by the most practical and expeditious means available

c. two-way communication is maintained by the aircraft’s intercom system or other suitable means, between the ground crew supervising the refuelling and the qualified personnel on board the aircraft.

*Note 1: Additional precautions are required when refuelling with fuels other than aviation kerosene or when refuelling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.*

*Note 2: There may be airport restrictions on the use of radio communications during refuelling operations.*

*Note 3: Helicopters should not be refuelled with passengers on board. A safety alert for operators highlighting current guidance and best-practices for operators that conduct fuelling with the engines running (hot fuelling) can be found at* [http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safos/all_safos/media/2010/SAFO10020.pdf](http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safos/all_safos/media/2010/SAFO10020.pdf).

**6.2.10 Surface Contamination**

An operator shall develop procedures to ensure that an aircraft does not take off or attempt to take off, that has frost, ice, or snow adhering to any critical surface except that takeoff may be made with frost under the wing in the area of the fuel tanks if such operations are conducted in
accordance with the aircraft manufactures instructions and are authorized by the civil aviation authority.

6.3  Operational Control

6.3.1 An operator shall establish an operational control system that meets the needs of the operation considering the complexity and area of operations. The system shall be described in the company operations manual and may be a pilot self-dispatch system. The operational control system shall
a. identify the person responsible for release of the flight,
b. specify flight planning requirements, and
c. specify when the pilot must advise the operator of the aircraft’s departure and arrival and the associated procedures.

6.3.2 The operational control system shall also include procedures for ensuring that:
   a. all operating requirements specified in this standard have been met
   b. the aircraft is operated within weight/mass and balance limits,
   c. the names of persons on board the aircraft are recorded or otherwise known by the operator, and
   d. search and rescue authorities are notified on a timely basis should an aircraft be overdue or missing.

Note: Procedure for notification of the operator as specified in 6.3.1.c and ensuring that search and rescue authorities are notified as specified in 6.3.2.d should especially address flight following considerations for VFR flights or situations where the IFR flight plan may be cancelled prior to landing. This becomes increasingly important when the destination aerodrome or heliport, is unattended or when no person is actively following the flight.

6.3.3 It is recommended that the operational control system also include procedures for ensuring that the pilot-in-command has access to appropriate information concerning the search and rescue services in the area over which the aircraft will be flown.

Note: This information may be made available to the pilot by means of the operations manual or such other means as is considered appropriate to the type of operation and the nature of the area to be overflown.

6.4  Weather Minima

6.4.1 The weather minima used for IFR departures and approaches shall be those specified in the instrument approach procedures approved for use by the operator.

6.4.2 No take-off minima:
   a. Operators shall specify a procedure in their operations manual for the determination of take-off minima from runways or heliports, where no take-off minima are specified.
   b. Such procedures shall include a risk analysis.

6.4.3 An operator shall not operate to or from an aerodrome or heliport, using operating minima lower than those which may be established for that aerodrome or heliport, by the State in which it is located, except with the specific approval of that State.

6.4.4 A flight shall not be continued towards the aerodrome or heliport of intended landing unless the
latest available meteorological information indicates that conditions at that aerodrome, or heliport, or at least one destination alternate aerodrome or heliport, will, at the estimated time of arrival, be at or above the specified aerodrome or heliport, operating minima.

6.4.5 Aerodrome Operating Minima

a. Operators shall establish procedures to restrict continuing an approach beyond the outer marker for precision approach or below 1000 feet above the aerodrome for a non-precision approach if the reported visibility is less than the specified minima.

b. These procedures shall include actions for the flight crew to take if the visibility is reported less than specified minima after passing the outer marker for precision approaches or below 1000 feet above the aerodrome for non-precision approaches.

c. The operator may allow deviations from these procedures if the State of Registry and State of Operation allows. However, in any case, the aircraft shall not continue its approach-to-land beyond a point at which the limits of the aerodrome or heliport operating minima would be infringed.

d. Whenever such deviations occur, the flight crew shall file a safety occurrence report to include the details of the event and the outcome.

6.4.6 Reserved

6.4.7 A flight to be operated in known or expected icing conditions shall not be commenced unless the aircraft is certificated and equipped to cope with such conditions.

6.4.8H *VFR Helicopter Operations* Operators shall establish VFR weather limits for both day and night operations that take into account the nature of the operations being conducted and the operating environment.

*Note: Regulatory minimum requirements established by the state may not be sufficient to support a particular operation or be conducive of best and safe practices. Operators/owners have the opportunity here to establish meaningful weather minimums to aid the pilot in conducting safe operations.*

6.5 All Weather Operations

6.5.1 An operator shall not permit an aircraft to conduct instrument approach or departures below standard Category I weather minima unless all equipment, training and operating requirements and regulatory requirements have been met.

6.5.2 An operator shall not permit an aircraft to conduct an instrument approach to Category II or III approach minima unless the operator has authorization from the civil aviation authority in the State of Registry and the authority of the State in which the CAT II or CAT III operations are being conducted. The minimum requirements to conduct Category II or III operations are:

a. approved Category II or III operating procedures in the company operations manual,

b. flight crew that are trained and certified to conduct Category II or III instrument approaches,

c. aircraft that are equipped, approved and maintained for Category II or III operations.
Note: For additional guidance on Category II and III operations see:

Guidance on Category II operations and related requirements, including the installation and approval of associated aircraft systems, may be found in FAA Advisory Circular 91-16, Category II Operations-General Aviation Airplanes and Advisory Circular 120-29A, Criteria for approval of Category I and Category II Weather Minima for Approach.

Guidance on Category III operations and related requirements may be found in FAA Advisory Circular 120-28, Criteria for Approval of Category III Landing Weather Minima.

Guidance on Category II and III operations and related requirements may be found in EU - OPS - Commercial Air Transportation (Aeroplanes) Subpart E – All Weather Operations, and - JAA-Temporary Guidance Leaflet - 12 - All Weather Operations – General Aviation.

6.6 Special Communications, Navigation, and Surveillance (CNS) Requirements and Approvals

6.6.1 Prior to operations in airspace where special CNS requirements exist such as Performance Based Navigation (PBN) Specifications, Minimum Navigation Performance Specification (MNPS), Reduced Vertical Separation Minimums (RVSM), Controller Pilot Data Link Communication (CPDLC), or Automatic Dependent Surveillance (ADS) B/C, an operator shall have a process to ensure that:

a. the aircraft and operator has been authorized by the State of Registry and, if required, the State of Operations;

b. the aircraft meets the aircraft system, airworthiness, continuing airworthiness (including maintenance personnel training) and operational requirements for the operations concerned; and

c. continuing RVSM height monitoring requirements have been met.

6.6.2 Flight Crew Authorization

a. Flight crews engaged in operations in airspace where special CNS requirements apply (i.e. PBN, RVSM, MNPS, CPDLC, ADS) shall be so authorized by an appropriately authorized manager.

b. To be considered qualified to be so authorized, each flight crew member shall complete training in the subject areas as required by the specific State authorizations and as necessary to ensure competency in operations in such airspace.

c. Such authorizations shall be included in the pilot training records.

Note 1: For further information on Performance Based Navigation, operators should review ICAO’s guidance at: http://www.icao.int/safety/pbn/Pages/default.aspx


6.7 Aircraft Operating Requirements
6.7.1 An operator is responsible for identifying and complying with all aircraft operating rules that the operator is subject to, as required by the civil aviation authority of the State of Registry and the States in whose airspace the operations are being conducted.

Note: Where State requirements deviate from ICAO SARPS, States are required to provide this information to ICAO and it is published in the Supplements of the appropriate ICAO documents. Experience has demonstrated that States do not always notify ICAO of such deviations; therefore, the State AIPs should also be checked. Operators may be able to obtain such a service from flight planning service providers.

6.8 Noise Certification and Abatement

6.8.1 An operator shall carry on board documentary proof attesting noise certification of the aircraft when such a document has been issued.

6.8.2 An operator shall ensure that the aircraft adheres to all published noise abatement procedures consistent with safety.

6.9 Aircraft Airworthiness

6.9.1 An operator shall ensure that aircraft are maintained and operated in accordance with their certificate of airworthiness and the provisions of the operator’s maintenance programme.

6.10 Use of Oxygen

6.10.1 Where an aircraft is operated at cabin-pressure-altitudes above 10,000 ft. (700 hPa) but not exceeding 13,000 ft. (620 hPa) each crew member shall wear an oxygen mask and use supplemental oxygen for any part of the flight at those altitudes that is more than 30 minutes in duration.

6.10.2 Where an aircraft is operated at cabin-pressure-altitudes above 13,000 ft. (620 hPa) each person on board the aircraft shall wear an oxygen mask and use supplemental oxygen for the duration of the flight at those altitudes.

6.10.3 The pilot at the flight controls of an aircraft shall use an oxygen mask if:
   a. the aircraft is not equipped with quick-donning oxygen masks, and  
   b. it is operated at or above FL 250.

6.10.4 It is recommended that the pilot at the flight controls of an aircraft shall use an oxygen mask if:
   a. the aircraft is operated above FL 410, or  
   b. if one pilot leaves the flight deck for any reason above FL 350.

Note: Specific State requirements may vary in the application of this requirement. Operators must meet the specific requirements of the State of Registry.

6.11 Passenger Safety Briefing

The pilot-in-command shall ensure that passengers are given a safety briefing appropriate to the passenger’s needs; and covers at least the items specified in this section as applicable for the type of operation.
6.11.1 Normal Operations

a. Prior to loading passengers, the safest direction and most hazard-free route for passenger movement to the aircraft and any dangers associated with the aircraft type such as pitot tube locations, propellers, main and tail rotor blades, or engine intakes.

b. Prior to take-off:
   i. when, where, why and how carry-on baggage is required to be stowed,
   ii. the fastening, unfastening, tightening and general use of safety belts or safety/shoulder harnesses,
   iii. when seat backs must be secured in the upright position and seats and tables must be stowed,
   iv. the location and operation of emergency exits,
   v. the location and use of the passenger oxygen system and masks,
   vi. the location, purpose of, and advisability of reading the passenger safety briefing card,
   vii. the requirement to obey crew instructions regarding safety belts and no smoking or fasten seat belt signs and the location of these signs,
   viii. the location of any emergency equipment the passenger may have a need for in an emergency situation such as the Emergency Location Transmitter, fire extinguisher, survival equipment (including the means to access if in a locked compartment), first aid kit, life preserver or flotation device and life raft,
   ix. the operator's procedures regarding the use of portable electronic devices, and
   x. other considerations based on the configuration of the aircraft cabin and equipment.

c. After take-off, if not included in the pre take-off briefing:
   i. on flights where smoking is permitted, when and where smoking is permitted on board the aircraft, and
   ii. the advisability of using safety-belts or safety/shoulder harnesses during flight.

d. In-flight when the "Fasten Seat Belt" sign has been turned on for reasons of turbulence:
   i. when the use of seat belts is required, and
   ii. the requirement to stow carry-on baggage.

e. Prior to passenger disembarking, the safest direction and most hazard-free route for passenger movement away from the aircraft following deplaning; and any dangers associated with the aircraft type such as pitot tube locations, propellers, main and tail rotor blades, or engine intakes.

6.11.2 The standard safety briefing may be modified for:

a. regular/recurring passengers who are familiar with the aircraft, route and have repeated exposure (e.g. company president) to that type of flight,

b. for EMS operations where a passenger briefing is not appropriate or

c. for operations where conducting a passenger briefing may interfere with the safety of the aircraft.

6.11.3 Where the foregoing safety briefing is insufficient for a passenger because of that passenger's physical, sensory or comprehension limitations or because that passenger is responsible for the care of another person on board the aircraft, the pilot-in-command shall ensure that the passenger is given an individual safety briefing that meets their individual needs.
6.11.4 Emergency Operations

The pilot-in-command shall ensure that, in the event of an emergency, where circumstances permit, all passengers are given an emergency briefing covering the following items:

a. safety belts or safety/shoulder harnesses;
b. seat backs, seats and tables;
c. carry-on baggage;
d. passenger safety briefing cards;
e. brace position (when to assume, how long to remain) and considerations for side facing seats;
f. evacuation procedures;
g. if applicable, life preservers; flotation devices and life rafts; and
h. if applicable, evacuation procedures for an occupant of a child restraint system.

6.11.5 Passenger Safety Briefing Card

An operator shall ensure that a passenger safety briefing card is readily available to each passenger that contains, in printed or pictographic form, information on at least the following safety features of the aircraft:

a. the location and operation of emergency exits;
b. the location and use of the passenger oxygen system (when installed);
c. the location of life jackets and life rafts (when on board); and

d. the location of other emergency equipment on board the aircraft in accordance with State of Registry requirements.

6.12 Use of Checklists

6.12.1 An operator shall establish a checklist for each type of aircraft that it operates and shall make the checklist available to the crew members. The checklist shall cover normal, abnormal and emergency operations and be consistent with the aircraft flight manual and related SOPs and shall include an effective date or date of last revision.

6.12.2 Every crew member shall follow the checklist in the performance of their assigned duties.

6.13 Fatigue Management

6.13.1 An operator shall establish and implement a fatigue management system that is designed to ensure that operator personnel involved in the operation and maintenance of aircraft do not carry out their duties when fatigued. The system shall contain the following elements:

a. fatigue management guiding principles,
b. appropriate training and education regarding preventive and operational fatigue countermeasures,
c. flight and duty time limitations, and
d. an evaluation process that assesses the effectiveness of the fatigue management system.

6.13.2 If deviations from the flight and/or duty time limitations are permitted, the system shall include provisions to:
6.13.3 Deviations shall be made only with the express approval of all personnel involved.

*Note: IG 6.13 contains an acceptable fatigue management program for the flight crew, and guidance material for aircraft maintenance and other support personnel. Operators are encouraged to use this material as a basis for development of their fatigue management programme for all personnel involved in the operation.*

6.14 Travel Health Issues

6.14.1 *It is recommended that operators engaged in international operations develop procedures for assessment of public health risks at out of country destinations and a response plan should passengers and/or crew be exposed to serious infectious disease or significant health risks.*

*Note: Information on public health issues and managing the associated risks is available on the World Health Organization web site at [http://www.who.int/en/](http://www.who.int/en/), the IATA Health Website and from national health authorities.*

6.15 Seating Requirements

6.15.1 Flight Crew Members at Duty Stations

a. *Take-off and landing.* All flight crew members required to be on flight deck duty shall be at their stations.
b. *En route.* All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the aeroplane or for physiological needs.
c. *Seat belts.* All flight crew members shall keep their seat belts fastened when at their stations.
d. *Safety/shoulder harness.* When safety/shoulder harnesses are provided, any flight crew member occupying a pilot’s seat shall keep the safety/shoulder harness fastened during the take-off and landing phases. All other flight crew members shall keep their safety/shoulder harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

*Note: Safety/shoulder harness includes shoulder strap(s) and a seat belt which may be used independently.*

6.15.2 Each cabin crew member shall be seated with seat belt or, when provided, safety/shoulder harness fastened during take-off and landing and whenever the pilot-in-command so directs.

6.15.3 During take-off and landing and whenever considered necessary, by reason of turbulence or any emergency occurring during flight, all passengers on board an aircraft shall be secured in their seats by means of the seat belts or harnesses provided.
6.16 Cabin Baggage

An operator shall specify procedures to ensure that all baggage carried onto an aircraft and taken into the passenger cabin is adequately and securely stowed.

6.17 Microphones and Headsets

An operator shall ensure that all flight crew members of:

a. large and turbojet aircraft who are required to be on flight deck duty communicate through boom microphones below the transition level/altitude. See section 8.16.4.

b. helicopters use headsets and communicate through a boom microphone at all times.

6.18A Personnel Qualified to Taxi Aeroplane

An operator shall have a procedure to ensure that an aeroplane is not taxied on the movement area of an aerodrome unless the person at the controls is an appropriately qualified pilot or:

a. has been duly authorized by the operator;

b. is fully competent to taxi the aeroplane;

c. is qualified to use the radio if radio communications are required; and

d. has received instruction from a competent person in respect of aerodrome layout, and where appropriate, information on routes, signs, marking, lights, ATC signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.

6.19H Helicopter Rotor Turning Under Power

An operator shall have a procedure to ensure that the helicopter rotor shall not be turned under power for the purpose of flight without a qualified pilot at the controls.

6.20 Maintenance Check Flights

Maintenance Check Flights present unique safety risks to the operator and must be managed effectively. Therefore, the operator should ensure the flight crew and maintenance personnel are properly trained to conduct such operations.

Note: Guidance regarding Maintenance Check Flights can be found in IBAC’s Safety Management Library at http://www.ibac.org/safety-management/safety-management-library.

6.21 Piloting Competency in Key Safety Areas (Recommended Practice)

The operator should establish procedures and training requirements to ensure each pilot maintains competency in key safety areas such as:

a) Manual Flying Skills
b) Stabilized Approaches
c) Runway Excursion Prevention
d) Automation Management
e) Upset Recovery
7.0 Operations in International Airspace

7.1 Sovereign and International Airspace

The territory of a State is deemed to be the land area and territorial waters adjacent thereto under the sovereign protection of such State. The airspace above such land and water is sovereign airspace. For the purpose of this chapter, all airspace outside the territory of a State is referred to as international airspace.

a. The operator shall establish procedures to ensure that when operating in the sovereign airspace of a State other than the State of Registry, the flight crew shall identify and apply the most restrictive requirements regarding the State of Registry and the State where the operations are being conducted.

b. The rules in force relating to flight and manoeuvre of aircraft when operating outside the airspace of any sovereign state, i.e. oceanic or high seas, shall be in accordance with ICAO Annex 2, Rules of the Air.”

7.2 Compliance

7.2.1 Operators shall maintain a process that ensures that flight crews are familiar with national, regional and international air navigation procedures and associated requirements prior to the commencement of flight into such airspaces. The process shall also ensure that flight crews comply with the requirements of their State of Registry or Operations, International Civil Aviation Organization (ICAO) Standards and Recommended Practices, published Regional Procedures and the regulations of each State in which they intend to land or overfly, as are pertinent to the performance of their respective duties in the operation of the aeroplane.

7.2.2 The aircraft operator shall be responsible for disembarking passengers and crew members from the time they leave the aircraft until they are accepted for examination for entry into a State and shall have procedures for discharging this responsibility.

Note 1: Operators should be aware that the fact that their State has filed differences with ICAO does not preclude them from the requirement to meet ICAO Standards when operating outside of their domestic airspace.

Note 2: Operators should be aware of variances in insurance requirements. It is important to determine the requirements for coverage for passengers, war risks, third party liability etc.

7.3 International Airspace Operations Qualifications

7.3.1 Flight Crew Authorization

a. Flight crews engaged in operations in international airspace shall be so authorized by the chief pilot.

b. To be considered qualified to be so authorized, each flight crew member shall have completed training in the subject areas as required by the specific authorizations and as necessary to ensure competency in operations in such airspace.

c. Such authorizations shall be included in the pilot training records.
7.3.2 For operations in international airspace the operator must, in particular, ensure that crews understand the relationship between State of Registry/Operator operating rules and procedures and the ICAO Rules of the Air when operating in such airspace. A suggested training course outline is contained in IG 7.0.

7.4 Reserved

7.5 Standard Operating Procedures

7.5.1 Prior to operating in international airspace involving performance based navigation, CPDLC, ADS-C, or ADS-B an operator shall:

a. establish and maintain standard operating procedures (SOPs) for international airspace operations,

b. ensure that all crews conducting such operations are trained in use of the SOP, and

c. ensure that a copy of the SOP of it is carried onboard the aircraft.

IG 7.0 provides guidance on complying with this requirement.

7.6 International Publications Library

It is recommended that operators intending to operate in international airspace should maintain or have access to a library of publications relevant to flight in international airspace. A suggested list of publications is provided in IG 7.0.
8.0 Aircraft Equipment Requirements

8.1 General

8.1.1 Aircraft shall be equipped in accordance with the requirements set out in ICAO Annex 6, Part II, or the applicable section of Annex 6 Part III, plus the requirements of this section, subject to any additional or more stringent requirements that may be imposed by the State of Registry or may be specified in State or Regional airspace rules. It is the responsibility of an operator to ensure that the aircraft is equipped and certified in accordance with these requirements.

8.1.2 All equipment required must be approved or otherwise meet the technical specifications prescribed by the State of Registry.

8.2A Instruments and Associated Equipment - Aeroplanes

8.2.1 All aeroplanes when operated VFR shall be equipped with a means of measuring and displaying:
   a. magnetic heading;
   b. the time in hours, minutes and seconds;
   c. pressure altitude; and
   d. airspeed.

8.2.2 All aeroplanes when operated IFR or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments shall be equipped with a means of measuring and displaying:
   a. magnetic heading (standby compass);
   b. the time in hours, minutes and seconds;
   c. pressure altitude;
   d. indicated airspeed (which includes a means of preventing malfunctioning due to condensation or icing);
   e. turn and slip;
   f. aircraft attitude;
   g. stabilised heading;
   h. adequate supply of power to the stabilised instruments;
   i. outside temperature;
   j. vertical climb or descent; and
   k. in addition to the above requirements aeroplanes operated by two pilots in accordance with the instrument flight rules or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with two independent attitude measuring and display systems.

8.2.3 All aeroplanes when operated at night shall in addition to the equipment specified in 8.2.2, be equipped with:
   a. the lights required by ICAO Annex 2 for night operation;
   b. illumination for all flight instruments and associated equipment;
   c. lights in all passenger compartments;
   d. a flashlight for each crew member station; and
   e. a landing light.
8.2.4 Emergency power supply for electrically operated attitude indicating instruments

Aeroplanes of a maximum certificated take-off mass of over 5700 kg newly introduced into service after 1 January 1975 shall be fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument (artificial horizon), clearly visible to the pilot-in-command. The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicator(s) is being operated by emergency power.

8.2H Instruments and Associated Equipment - Helicopters

8.2.1 All helicopters when operated VFR by day shall be equipped with a means of measuring and displaying:
   a. magnetic heading;
   b. the time in hours, minutes and seconds;
   c. pressure altitude;
   d. airspeed

8.2.2 All helicopters when operated under VFR at night, or when the helicopter cannot be maintained in a desired attitude without reference to one or more flight instruments, shall, in addition to the equipment specified in 8.2.1, be equipped with a means of measuring and displaying:
   a. attitude (for each required pilot);
   b. slip;
   c. stabilised heading;
   d. vertical climb or descent.

8.2.3 All helicopters when operated under IFR shall be equipped with a means of measuring and displaying:
   a. magnetic heading;
   b. the time in hours, minutes and seconds;
   c. pressure altitude;
   d. airspeed (which includes a means of preventing malfunctioning due to condensation or icing);
   e. slip;
   f. attitude (for each required pilot plus an additional one);
   g. stabilised and corrected heading;
   h. adequate supply of power to the stabilised instruments;
   i. outside temperature;
   j. vertical climb or descent;

8.2.4 All helicopters when operated at night or under IFR shall, in addition the equipment specified in 8.2.2 or 8.2.3, be equipped with:
   a. illumination for all flight instruments and associated equipment;
   b. lights in all passenger compartments;
   c. a flashlight for each crew member station.
   d. a landing light;
8.2.5 It is recommended that the landing light be trainable at least in the vertical plane. This can be achieved either with a manoeuvrable light or with the use of switchable LEDs arrays which provide a similar facility.

8.3 Operational Information and Documentation

8.3.1 The following documentation and information (in written or electronic form) shall be carried on-board the aircraft and the operational information shall be accessible on the flight deck:

a. pertinent aeronautical charts;
b. pertinent en route, terminal area, and instrument approach procedure charts;
c. aircraft performance data;
d. aircraft checklists;
e. the Company Operations Manual;
f. Standard Operating Procedures, where an SOP has been established for the aircraft;
g. the aircraft flight manual;
h. the aircraft minimum equipment list (MEL) for aircraft being operated in accordance with a MEL;
i. aircraft certificate of airworthiness or other flight authority and certificate of registration;
j. aircraft radio licence;
k. insurance certificate;
l. other documents required of the area of operation;
m. procedures for pilots-in-command of intercepted aircraft and visual signals for use by intercepting and intercepted aircraft, as contained in ICAO Annex 2, and
n. for international commercial air transport operations, a certified true copy of the air operator certificate including the authorizations, conditions and limitations relevant to the aircraft type.


Note 2: US commercial operators can find guidance material on obtaining a certified true copy of the air operator certificate at:
http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/all_infos/media/2009/InFO09019.pdf

8.4 Seats, Safety Belts and Safety/Shoulder Harnesses

8.4.1 Except as provided in 8.4.2H below, aircraft shall be equipped with:

a. a seat for each occupant of the aircraft, except for infants under an age specified by the State of Registry;
b. a safety belt, having a metal-to-metal latching device, for each passenger (other than infants);
c. a safety/shoulder harness for each flight crew member and any other person occupying a flight deck seat or a sideways facing seat; and

d. a safety/shoulder harness for each cabin crew member seat that is not a regular passenger seat.
8.4.2H For helicopter operations where in-flight transfer of personnel or door-open operations is required, unless otherwise prohibited, a crew member may operate without the provision of a seat provided a secure safety/shoulder harness is fitted and used.

8.5 Emergency Equipment - General

8.5.1 All aircraft shall be equipped with:
   a. first aid kit;
   b. fire extinguishers for use in the crew, passenger and cargo compartments; and
   c. for aircraft with a seating configuration of more than 19 passengers, a crash axe.

8.5.2 *It is recommended that all pressurized aeroplanes be equipped with portable breathing equipment to protect the aircraft crew from the effects of smoke, carbon dioxide or other harmful gases or an oxygen deficient environment while combating fires on board the aircraft.*

   *Note: The carriage of an automated external defibrillator (AED) may be determined by operators on the basis of a risk assessment, taking into account the particular needs of the operation.*

8.5.3 *It is recommended that placards be installed to readily identify the location of aircraft emergency equipment.*

8.5.4 An aeroplane shall be equipped with means of ensuring that the following information and instructions are conveyed to passengers:
   a. when seat belts are to be fastened;
   b. when and how oxygen equipment is to be used if the carriage of oxygen is required;
   c. restrictions on smoking;
   d. location and use of life jackets or equivalent individual flotation devices where their carriage is required;
   e. location of emergency equipment; and
   f. location and method of opening emergency exits.

8.5.5 Information for Rescue Coordination
   a. An operator shall have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board the aeroplane engaged in international air navigation.
   b. The information shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

8.6A Flights over Water - Aeroplanes

8.6.1 All aeroplanes operated on extended flights over water\(^1\) shall be equipped with, at a minimum, one life jacket or equivalent individual floatation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided. Each

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\(^1\) ICAO Annex 6, Part II: A flight operated over water at a distance of more than 93 km (50 NM), or 30 minutes at normal cruising speed, whichever is the lesser, away from land suitable for making an emergency landing.
8.6.2 The operator of an aeroplanes operated on an extended flight over water shall determine the risks to survival of the occupants of the aircraft in the event of ditching. The operator shall take into account the operating environment and conditions such as, but not limited to, sea state and sea and air temperatures, the distance from land suitable for making an emergency landing, and the availability of search and rescue facilities. Based upon the assessment of these risks, the operator shall, in addition to the equipment required in 8.6.1, ensure that the aircraft is appropriately equipped with:

a. life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such lifesaving equipment, including means of sustaining life, as is appropriate to the flight to be undertaken; and

b. equipment for signalling distress.

Note 1: When both VHF and HF communications equipment are required for the route and the aircraft has two VHF communications units, only one HF communications unit is required.


8.6H Flights over Water - Helicopters

8.6.1 All helicopters shall be fitted with a permanent, or rapidly deployable, means of flotation so as to ensure a safe ditching of the helicopter when engaged in any overwater operations where the helicopter flight crew is likely to be forced to execute a ditching manoeuvre in the case of a power-plant failure.

8.6.2 All helicopters operating in accordance with the provisions of 8.6.1 shall be equipped with:

a. A life jacket; equipped with a means of electrical illumination for the purpose of facilitating the location of persons; for each person on board; and stowed in a position easily accessible from the seat of the person whose use it is provided;

b. Life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in an emergency;

c. With each life-saving raft, equipment providing means of sustaining life as appropriate to the operations being undertaken;

d. Equipment for making the pyrotechnical distress signals described in Annex 2.

8.6.3 For ‘offshore operations’ the life jacket shall be worn unless the occupant is wearing an integrated survival suit that includes the functionality of the life jacket.

8.6.4 For ‘offshore operations’ it is recommended that survival suits be worn by all occupants when the sea temperature is less than 10°C or when the estimated rescue time exceeds the calculated survival time. When the elevation and strength of the sun results in a high temperature hazard on the flight deck, consideration should be given to alleviating the flight crew from this recommendation.
Note: When establishing rescue time, the sea state and the ambient light conditions should be taken into consideration.

8.6.5 All helicopters taking off or landing at a heliport where the departure or approach path is so disposed over water that in the event of a foreseeable event there would be a likelihood of ditching, shall be equipped as in 8.6.2 a.

8.6.6 It is recommended that life rafts carried in accordance with 8.6.2.b should be deployable by remote control.

8.6.7 It is recommended that life rafts, which are not deployable by remote control and which have a mass of 40 kg or more, be provided with a means of mechanically assisted deployment.

8.7 Flights Over Remote Land Areas

8.7.1 For flights across land areas which have been designated by the State concerned as an area in which search and rescue would be especially difficult, aircraft shall be equipped with signalling devices and life-saving equipment (including means of sustaining life) as is appropriate to the area overflown.

Note 1: Information on any areas which a State has designated as an area in which search and rescue would be especially difficult should be included in the State’s AIP. Links to State AIPs can be found through the ICAO GIS Portal at http://192.206.28.84/Website/AIPS-online.html. However, it is recommended that operators apply judgement when flying over remote areas where harsh environmental conditions may be encountered.

Note 2: Guidance on appropriate equipment for the nature of the terrain and climate is available from most survival equipment providers.

8.8 High Altitude Flights - Oxygen Requirements

8.8.1 All aeroplanes intended to be operated at altitudes where the use of oxygen has been prescribed, shall be equipped with sufficient oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required under section 6.2.6.

8.8.2 All helicopters intended to be operated at altitudes where the use of oxygen has been prescribed, shall carry equipment for storing and dispensing the oxygen supplies required in 6.2.6

8.9 Icing Protection and Weather Detection Equipment

8.9.1 For operations in known or forecast icing conditions, all aircraft shall be certified and equipped to cope with such conditions.

8.9.2A Pressurized aeroplanes when carrying passengers shall be equipped with operative weather-detecting equipment capable of detecting thunderstorms whenever such aeroplanes are being operated in areas where such conditions may be expected to exist along the route either at night or under instrument meteorological conditions.

8.9.2H It is recommended that helicopters when carrying passengers shall be equipped with operative weather-detecting equipment capable of detecting thunderstorms whenever such helicopter are
being operated in areas where such conditions may be expected to exist along the route either at night or under instrument meteorological conditions.

8.10A ELT - Aeroplanes

8.10.1 Except as provided in 8.10.2, all aeroplanes shall be equipped with at least one ELT of any type.

8.10.2 All aeroplanes for which the individual Certificate of Airworthiness was first issued after 1 July 2008 shall be equipped with at least one automatic ELT.

8.10.3 It is recommended that all aircraft carry an automatic ELT.

8.10.4 ELTs carried to satisfy the requirements of 8.10.1 and 8.10.2 shall be capable of operation on both 406 MHz and 121.5 MHz simultaneously in accordance with the relevant provisions of Annex 10, Volume III.

8.10H ELT - Helicopters

8.10.1 All helicopters shall be equipped with at least one automatic ELT; and

8.10.2 All helicopters operating over water in accordance with 8.6.1 a. or b. shall be equipped with at least one ELT(S) in a raft or life jacket.

8.10.3 ELTs carried to satisfy the requirements of 8.10.1 and 8.10.2 shall be capable of operation on both 406 MHz and 121.5 MHz simultaneously in accordance with the relevant provisions of Annex 10, Volume III.

8.11A GPWS - Aeroplanes

8.11.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

8.11.2 A ground proximity warning system shall provide automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth’s surface.

8.11.3 A ground proximity warning system shall provide, as a minimum, warnings of at least the following circumstances:
   a. excessive descent rate;
   b. excessive altitude loss after take-off or go-around; and
   c. unsafe terrain clearance.

8.11.4 GPWS Data Management
   a. Operators shall have a process to ensure that the data base for ground proximity warning systems with predictive terrain hazard warning is kept current.
   b. Pilots shall be trained in use of the system.

8.11H GPWS - Helicopters

8.11.1 For a helicopter which is equipped with a ground proximity system:
a. the GPWS shall provide:
   i. automatic, timely and distinctive warning to the flight crew when the aircraft is in potentially hazardous proximity to the earth’s surface, and
   ii. as a minimum, warnings of at least the following circumstances:
      A. excessive descent rate,
      B. excessive altitude loss after take-off or go-around, and
      C. unsafe terrain clearance; and

b. The operator shall have a process to ensure that the data base for ground proximity warning systems with predictive terrain hazard warning is kept current.

c. Pilots shall be trained in use of the system.

8.12 ACAS II

8.12.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 15 000 kg or authorized to carry more than 30 passengers, for which the individual airworthiness certificate is first issued after 1 January 2007, shall be equipped with an airborne collision avoidance system (ACAS II).

8.12.2 It is recommended that all turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 15 000 kg, or authorized to carry more than 30 passengers, for which the individual airworthiness certificate is first issued after 24 November 2005, be equipped with an airborne collision avoidance system (ACAS II).

8.12.3 It is recommended that all turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg, or authorized to carry more than 19 passengers, for which the individual airworthiness certificate is first issued after 1 January 2008, be equipped with an airborne collision avoidance system (ACAS II).

Note: For operations in some airspace it is mandatory that aircraft be equipped with ACAS II.

8.13 ATC Transponder and Altitude Reporting System

8.13.1A All aeroplanes operating IFR shall be equipped with a pressure altitude reporting transponder, with the exception of those VFR only operations that have been exempted by the appropriate civil aviation authorities.

8.13.1H All helicopters shall be equipped with a pressure altitude reporting transponder, unless exempted by the appropriate civil aviation authorities.

8.14A Flight Data Recorders and Cockpit Voice Recorders - Aeroplanes

8.14.1 All aeroplanes for which the individual certificate of airworthiness was first issued on or after January 1, 1989 and that have a maximum certificated take-off mass over 27 000 kg, shall be equipped with a Type I flight data recorder.

8.14.2 All aeroplanes for which the individual certificate of airworthiness was first issued on or after January 1, 2005 that have a maximum certificated take-off mass of over 5 700 kg shall be equipped with a Type IA flight data recorder.
8.14.3 It is recommended that all aircraft for which the individual certificate of airworthiness was first issued on or after January 1, 1989 and that have a maximum certificated take-off mass over 5 700 kg should be equipped with a Type II flight data recorder.

8.14.4 All aeroplanes for which the individual certificate of airworthiness was first issued on or after January 1, 1987 and that have a maximum take-off mass over 27 000 kg shall be equipped with a cockpit voice recorder.

8.14.5 It is recommended that all aeroplanes that have a maximum certificated take-off mass of more than 5 700 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1987, should be equipped with a cockpit voice recorder.

8.14.6 The pilot-in-command, and/or the owner/operator, shall ensure, to the extent possible, in the event an aeroplane becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with ICAO Annex 13.

8.14.7 Flight data and cockpit voice recorders shall not be switched off during flight time.

8.14.8 The operator shall include in their operations manual procedures on the post-flight protection and use of flight and cockpit voice recorder data.

Note 1: As some State’s FDR and CVR rules do not meet ICAO standards, aeroplanes have been built that meet national requirements but do not meet the foregoing requirements. Retrofit of many of these aeroplanes is impractical. In such cases, an acceptable solution would be for operators of such aeroplanes to include a provision in their operations manual whereby such non-conforming aeroplanes would be restricted to operations within domestic airspace except when the operator has obtained prior permission from the State in whose airspace the aeroplane will operate. Links to the civil aviation authorities of ICAO member states can be found at [http://legacy.icao.int/icao/en/m_links.html](http://legacy.icao.int/icao/en/m_links.html).

Note 2: All aeroplanes of a maximum certificated take-off mass over 5 700 kg, required to be equipped with an FDR and a CVR, may alternatively be equipped with two combination recorders (FDR/CVR).

8.14H Flight Data Recorders and Cockpit Voice Recorders - Helicopters

8.14.1 All helicopters of a maximum certificated take-off mass of over 7 000 kg, or having a passenger seating configuration of more than nineteen, for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with a Type IV FDR.

8.14.2 All helicopters of a maximum certificated take-off mass of over 3 180 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2016 shall be equipped with a Type IVA FDR.

8.14.3 It is recommended that helicopters of a maximum certificated take-off mass of over 3 180 kg, up to and including 7 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989 should be equipped with a Type V FDR.

8.14.4 All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.
8.14.5 It is recommended that all helicopters of a maximum certificated take-off mass of over 3 180 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 should be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed should be recorded on the CVR.

8.14.6 The pilot-in-command, and/or the owner/operator, shall ensure, to the extent possible, in the event a helicopter becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with ICAO Annex 13.

8.14.7 Flight data and cockpit voice recorders shall not be switched off during flight time.

8.14.8 The operator shall include in their operations manual procedures on the post-flight protection and use of flight and cockpit voice recorder data.

8.15 Minimum Equipment List

8.15.1 Where a master minimum equipment list (MMEL) is established for the aircraft type, the operator shall include in the operations manual a minimum equipment list (MEL) approved by the State of Registry of the aircraft which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

8.15.2 Where an operator has developed a MEL, maintenance personnel and flight crews shall be trained in the use of it and a copy of the MEL shall be carried on the aircraft.

Note: Guidance on MEL development and use may be found in FAA Circular AC 91-67 - Minimum Equipment Requirements For General Aviation Operations Under FAR Part 91.

8.16 Communications and Navigational Equipment

8.16.1 All aircraft shall be equipped with radio communication equipment to permit the pilot to conduct two-way communications on the appropriate aeronautical frequencies.

When compliance with 8.16.1 requires that more than one communication equipment unit be provided, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.

8.16.2 All aircraft shall be equipped with sufficient radio navigation equipment to receive radio signals from the transmitting facilities to be used and to permit the aircraft to navigate in the event of the failure of one navigation unit.

8.16.3 An operator shall establish procedures for ensuring that electronic navigation data bases are compatible with the intended function of the equipment and are current.

8.16.4A All turbojet-engined aeroplanes and those with a maximum takeoff mass exceeding 5 700 kg shall be equipped with a boom microphone at all flight crew stations.

8.16.5H All helicopters shall be equipped with headset with boom microphone and a transmit button on the flight controls for each required pilot and crew member at his working station.
8.16.6A On flights in which it is intended to land in instrument meteorological conditions, an aeroplane shall be provided with radio equipment capable of receiving signals providing guidance to a point from which a visual landing can be achieved. This equipment shall be capable of providing such guidance for each aerodrome at which it is intended to land in instrument meteorological conditions and for any designated alternate aerodromes.
9.0 Aircraft Maintenance Requirements

9.1 Maintenance Control System

9.1.1 An operator, other than one to which 9.1.2 applies, shall establish a maintenance control system that is appropriate to the:
   i. number and types of aircraft operated,
   ii. complexity of the operations,
   iii. identified hazards and associated risks,
   iv. operator safety policy and its objectives, and
   v. manner by which the maintenance is conducted.

   Note: IG 9.1 provides guidance on complying with this requirement.

9.1.2 An operator to which the EASA rules apply shall have a continuing airworthiness management system that meets the requirements of (EC) No 2042/2003 Annex I (Part-M) as amended.

   Note 1: It is the owner's/lessee's/operator's (as applicable) responsibility to take all appropriate actions to ensure adequate oversight of the contracted CAMO for the continued airworthiness of its aircraft/fleet. See IG 9.1.2 for more information.

   Note 2: The CAMO oversight process should be integrated into the compliance monitoring system required by IS-BAO 3.3.1.

The remaining provisions of section 9.1 apply only to those operators to which section 9.1.1 applies.

9.1.3 The operator shall have a written description of its maintenance control system in its company operations manual or maintenance manual.

9.1.4 In that section of the company operations manual or maintenance manual, the operator shall provide a detailed description of the maintenance control system containing at least the following information:
   a. where maintenance functions have been assigned:
      i. the position or title of the person to whom functions have been assigned,
      ii. a description of the functions and scope of work that have been assigned to each position, person or organization, and
      iii. where necessary for clarity, a chart depicting the distribution of functions and lines of authority;
   b. for elementary work or preventative maintenance and aircraft servicing:
      i. identification of those standards or maintenance data (aircraft manufacturer, civil aviation authority or other) to be used,
      ii. procedures to confirm that regulatory information and technical data appropriate to the work performed are used;
      iii. details of the methods used to record the maintenance, elementary work/preventative maintenance or servicing performed, and to ensure that any defects are recorded in the aircraft technical record;

   Note: Elementary work or preventative maintenance means simple or minor maintenance operations and the replacement of small standard parts not involving complex assembly. Such work is classified as maintenance and must be recorded as such, certified by individuals authorized to do so by the State of Registry.
c. the identification of any maintenance schedule/programme authorized by the State of Registry;

d. a detailed description of the procedure used to ensure that any maintenance tasks required by the maintenance schedule/programme, an airworthiness directive, or any task required for the rectification of a defect is completed within the time constraints specified in national regulations;

e. a description of the assessment programme for aircraft Service Bulletins and Airworthiness Directives and the associated documentation;

f. procedures to ensure that only parts and materials that meet regulatory requirements and manufacturer’s specifications are used in the performance of maintenance and elementary work/preventative maintenance or servicing including any details respecting parts-pooling arrangements that have been entered into;

Note: This is intended to include any stores procedures that may be used by the operator, including those procedures used for the control of petroleum, oil and other lubricants, as required by State regulation.

g. procedures to ensure that properly calibrated tools are used in the performance of maintenance, elementary work/preventative maintenance or servicing,

h. a description of the maintenance training and required competencies of the maintenance staff;

Note: As the IS-BAO addresses the organization as a whole, rather than separate elements within the organization, training for all personnel is addressed in the chapter 5.

i. a description of the kinds of personnel and training records kept;

j. a description of the procedure used to ensure that the Basic Empty Weight (BEW) of an aircraft is maintained, current and properly documented;

k. the identification of any person eligible to apply for a flight permit or special flight authorization in respect of the operator’s aircraft;

l. procedures for a tool control programme designed to ensure tools, supplies, and test equipment are accounted for following maintenance performed on an aircraft;

m. fatigue management system as required by section 6.13, and

n. procedures to manage the risks associated with maintenance personnel working alone.

9.1.5 An operator must provide a copy of the relevant manual section that details the maintenance control system, or relevant portions thereof, to each person or organisation, who performs or certifies work. In the case where only a portion of the manual is provided, it must be sufficiently comprehensive that the person or organisation, performing the tasks has all relevant information. For non-scheduled work, temporary copies of the relevant portions of the operations manual section that details the maintenance control system, or any incorporated reference, may be sent electronically.

9.1.6 In the part of the manual that describes its maintenance control system, an operator shall include defect recording and rectification control procedures for:

a. recording aircraft defects;

b. ensuring that defects are rectified in accordance with regulatory requirements and manufacturer’s specifications;

c. detecting defects that recur and identifying those defects as recurring defects; and

d. scheduling, within the permitted period of deferral, the rectification of defects whose repair has been deferred.
9.1.7 In the part of the manual that describes the maintenance control system, an operator shall include technical dispatch instructions that:
   a. ensure that aircraft are;
      i. maintained in an airworthy condition,
      ii. appropriately equipped, configured and maintained for the intended use, and
      iii. maintained in accordance with the authorized maintenance program;
   b. ensure that all MEL procedures are followed and requirements met;
   c. meet the requirements of the State of Registry civil aviation regulations and standards; and
   d. ensure that a maintenance release is completed and signed, as prescribed by the State of Registry, to certify that the maintenance work has been performed in accordance with the maintenance programme or other data and procedures acceptable to the State of Registry.

9.1.8 An operator may deviate from the procedures required by its maintenance control system where the deviation conforms to national regulations and is substantiated by a risk analysis.

9.1.9 The owner or operator of an aircraft, or in the case where it is leased, the lessee, shall ensure that the following records are kept for the periods mentioned below:
   a. the total time in service (hours, calendar time and cycles, as appropriate) of the aircraft and all life limited components;
   b. the current status of compliance with all applicable mandatory continuing airworthiness information, including life limited components;
   c. appropriate details of modifications and repairs to the aircraft;
   d. the time in service (hours, calendar time and cycles, as appropriate) since the last overhaul of the aircraft or its components subject to a mandatory overhaul life;
   e. the current status of the aircraft’s compliance with the maintenance programme; and
   f. the detailed maintenance records to show that all requirements for the signing of a maintenance release have been met.

The records in 9.1.9.a. to 9.1.9.e., shall be kept for a minimum period of 90 days after the unit to which they refer has been permanently withdrawn from service and the records in 9.1.9.f. for a minimum period of one year after the signing of the maintenance release.

*Note: State of Registry requirements for record retention may vary and must be respected.*

9.1.10 An operator of an aeroplane of a maximum certificated take-off mass in excess of 5 700 kg or helicopter with a maximum certificated take-off mass in excess of 3 175 kg, shall, as prescribed by the State of Registry, ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness is transmitted to the State of Registry as required.

9.1.11 An operator of turbojet-engined aeroplanes or those with a maximum takeoff mass exceeding 5700 kg or any aircraft engaged in commercial operations, shall ensure the maintenance program:
   a. observes Human Factors principles according to the State of Registry’s guidance material;
   b. includes, if applicable, a continuing structural integrity programme; and
   c. includes, when applicable and approved by the State of Registry, condition monitoring and reliability programme descriptions for aircraft systems, components and powerplants.
9.1.12 It is recommended that the maintenance programme be based on information made available by the State of Design or by the organization responsible for the type design, and any additional applicable experience.

9.2 Maintenance Agreements

9.2.1 No operator shall permit a person or organisation to perform maintenance on an aircraft unless the person is an employee of the operator or has been authorized to perform the work under the terms of a written maintenance agreement or other form of authorization specified in the company operations manual or maintenance manual.

9.2.2 Operators shall include procedures in the company operations manual for flight crew to obtain aircraft maintenance services when away from home base.

9.2.3 It is recommended that operators include provisions in maintenance agreements that ensure that maintenance personnel do not carry out maintenance work when they are fatigued.

9.3 Person Responsible for Maintenance

9.3.1 An operator shall:
   a. appoint a person to be responsible for its maintenance control system; and
   b. authorize the person who is responsible for its maintenance control system to remove aircraft from operation, where the removal is justified because of non-compliance with the requirements of national regulations or because of a threat to the safety of the aircraft, persons or property.

9.3.2 The operator shall provide the person who is responsible for its maintenance control system with the staff, facilities and other resources necessary to ensure that the maintenance is conducted in accordance with the civil aviation authority requirements and meets the safety management goals of the operator.

   Note: Where an operator is the holder of an approved maintenance organization (AMO) that is appropriate to the aircraft being operated, the person responsible for maintenance may be the person responsible for the maintenance control system of the AMO.

9.4 Maintenance Personnel Recency

9.4.1 An operator shall ensure that no person signs a maintenance release unless within the preceding 24 months that person has had at least six months experience in the inspection, servicing or maintenance of an aircraft or system in accordance with the privileges granted by the licence held.
10.0 **Company Operations Manual**

10.1 An operator shall establish and maintain a company operations manual\(^1\), or manuals. It may be issued in separate parts corresponding to specific aspects of an operation. It shall include the instructions and information necessary to enable the personnel concerned to perform their duties safely.

An operator shall provide a manual, or appropriate portions of the manual, to each person who requires those instructions and/or that information to perform their duties. The operations manual shall be amended or revised as is necessary to ensure that the information contained therein is kept up to date. All such amendments or revisions shall be issued to all personnel that are required to use this manual.

10.2 An operations manual for non-commercial aeroplane operations shall contain at least the following:

- a. table of contents;
- b. amendment control page and list of effective pages, unless the entire document is re-issued with each amendment and the document has an effective date on it;
- c. duties, responsibilities and succession of management and operating personnel;
- d. operator safety management system;
- e. operational control system;
- f. MEL procedures (where applicable);
- g. the normal operating requirements and procedures
- h. SOPs;
- i. weather limitations;
- j. fatigue management system;
- k. emergency equipment and operating procedures;
- l. accidents/incidents consideration;
- m. personnel qualifications and training;
- n. record keeping;
- o. a description of the maintenance control system;
- p. security procedures;
- q. performance operating limitation
- r. use/protection of FDR/CVR records, if installed; and
- s. handling of dangerous goods.

*Note: IG 10.0 provides guidance on meeting this requirement plus the Annex 6 Part III specifications for an operations manual for a helicopter operator. A generic operations manual is also available for guidance in developing a company operations manual for non-commercial aeroplane operators.*

10.3 An operator shall include in the company operations manual a description of the process to allow deviations from the provisions contained in it (if the operator allows deviations) and specify the

\(^1\) *The term “company operations manual” is used as it is the term used for related IS-BAO documents. Operators may use the any term they consider appropriate when referring to their operations manual.*
person who may approve such deviations. Any deviation shall identify the associated conditions under which it is permitted or required, and should be based on a risk assessment process.

10.4  *The design of the company operations manual and all associated manuals should observe Human Factors principles. *(Recommended Practice)*

*Note: Guidance material on the application of Human Factors principles can be found in the ICAO Human Factors Training Manual (Doc 9683).*
11.0 Emergency Response Plan

11.1 An operator shall have a plan detailing the procedures to be followed in the event of an accident, incident or other emergency. Compliance with the plan is mandatory in the case of accidents involving substantial damage to aircraft or injury to passengers, crew members or persons on the ground. In the case of other accidents, incidents or emergencies, compliance will be at the discretion of the operator, subject to any requirements imposed by law by the State of Registry or the law of State in which the accident or incident occurred.

11.2 The emergency response plan must address in-flight incidents involving injuries to, or serious medical problems suffered by, passengers or crew members.

11.3 The emergency response plan must also address accidents and incidents not involving aircraft flight operations, such as those occurring during aircraft maintenance activities.

11.4 The emergency response plan shall include, as applicable:
   a. depending on the nature and location of the accident, procedures for the flight crew or organization to notify the appropriate authority in the State where the accident occurred and to seek medical assistance, as required;
   b. procedures for the operator’s personnel to notify organization officials of the accident, incident or other event;
   c. procedures for the operator to notify State agencies of the accident, as may be required by law;
   d. procedures for notification of next of kin;
   e. on-site procedures to be taken by the flight and cabin crew to assist passengers, prepare visual distress signals (if in a remote area), and preserve the integrity of the accident site;
   f. procedures for dealing with questions from and providing assistance to the families of passengers and crew members;
   g. procedures for dealing with questions from the media;
   h. procedures for participating or co-operating with State agencies and police authorities who may be investigating the accident; and
   i. considerations for dealing with the effects of the accident on the organization’s operations and on employees (i.e. trauma counselling services and other crises intervention support for persons involved or affected by the event).

11.5 Personnel who have a role in the emergency response plan shall be trained in their role and the plan shall be exercised in order to test its integrity.

12.0 Environmental Management

12.1 An operator shall have a process to identify and comply with all national and local environmental laws and requirements, including those related to:

a. noise abatement procedures consistent with safety, including airport curfews;
b. ground operations including aircraft fuelling and de/anti-icing procedures;
c. spill containment of toxic and flammable materials and chemicals, including disposal of collected materials;
d. disposal of waste materials;
e. disposal of international garbage;
f. the construction and operation of the operator’s:
   i. hangars,
   ii. fuel storage and dispensing equipment,
   iii. other facilities; and

g. operations subject to emissions charges, fees, or purchase of credits related to Market Based Measures regulations (e.g. Emissions Trading Schemes).

12.2 Operators should also be aware of local environmental rules and procedures at destination and en-route airports.

**Note 1:** Operator should ensure that they are in compliance with local environmental policies (fuel spill containment, waste water, de-icing fluid capture, noise, etc. Most jurisdictions have an environmental protection agency and most airports have an environmental plan that the operator could/should harmonize with. As for other destinations, it may be prudent for the operator to research frequently visited locations to determine if there are any special environmental policies or procedures.

13.0 Occupational Health and Safety

13.1 An operator shall have a process to identify and comply with all national and local occupational health and safety laws and requirements, including those related to:
   a. development and implementation of workplace safety programmes;
   b. compliance with fire safety, first aid and sanitary requirements;
   c. provision of safety and protective clothing, devices and equipment, particularly fall protection for aircraft maintenance personnel;
   d. provision of safety information and training to employees;
   e. ensuring that machinery, tools and equipment, including lifting equipment, meets safety standards; and
   f. ensuring that hazardous materials are controlled and that employees have information and training in their handling and storage.

13.2 An operator shall develop procedures to ensure that all company personnel and passengers accessing the aviation environment associated with company operations are made aware of the occupational health and safety requirements and adhere to the associated operator’s procedures.

   **Note 1:** These provisions need not be contained in the company operations manual, but the operator must have a process to ensure that local and national requirements are met.


   **Note 3:** The European Agency for Safety and Health at Work website [http://agency.osha.eu.int](http://agency.osha.eu.int) also contains extensive guidance material and regulatory references.

13.3 It is recommended that operators include considerations for the safety of any person who may be working alone.
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14.0 Transportation of Dangerous Goods

14.1 Considerations for All Operators

14.1.1 Dangerous goods are defined as those articles or substances that are capable of posing significant risks to health, safety or property when transported by air. Operators shall not transport dangerous goods except where authorized under and in accordance with the provisions of the ICAO Technical Instruction for the Safe Transport of Dangerous Goods (hereafter called ICAO Technical Instructions) or the IATA Dangerous Goods Regulations.

14.1.2 An operator shall have a system to advise passengers of what constitutes dangerous goods, and whether and how those goods can be carried on aircraft.

14.1.3 Aircraft crew members shall receive training on these procedures at least every two years.

Note: Appropriate training is available from many shipping companies. Also, hazardous materials training and information is available from the US DOT at http://www.phmsa.dot.gov/ and FAA at http://www.faa.gov/about/office_org/headquarters_offices/ash/ash_programs/hazmat/materials_carried_by_passengers_and_crew.pdf.

14.2 Dangerous Goods Transportation Requirements

14.2.1 Prior to transporting dangerous goods an operator shall ensure that all State regulatory requirements have been met.

14.2.2 In particular, operators that transport dangerous goods, whether it is organization’s property, the property of organization personnel, or the property of a third party, shall ensure that the goods are:
   a. classified,
   b. packed,
   c. labelled and marked,
   d. loaded,
   e. stowed,
   f. accompanied by documentation, and
   g. transported in accordance with the provisions of the ICAO Technical Instructions, or the IATA Dangerous Goods Regulations and the rules specified by the State of the operator.

14.2.3 An operator shall ensure that all personnel involved in the transportation of dangerous goods are trained and certified in accordance with the ICAO Technical Instructions or the IATA Dangerous Goods Regulations and the rules specified by the State of the operator.

14.2.4 An operator shall also have a system to advise their shipping departments of what constitutes dangerous goods and whether and how those goods can be carried on aircraft.

14.2.5 An operator shall not accept dangerous goods for transport from third parties unless those parties have complied with all relevant provisions of the ICAO Technical Instructions or the IATA Dangerous Goods Regulations and the rules specified by the State of the operator.
14.2.6 An operator shall ensure that the pilots-in-command of their aircraft are informed of what dangerous goods are being carried on board the aircraft, as early as practicable before the departure of the aircraft.

14.2.7 In the event an aircraft carrying dangerous goods is involved in an accident or serious incident, the operator of an aircraft carrying dangerous goods shall provide information, without delay, to emergency personnel responding to the accident or serious incident about the dangerous goods on board, as shown in the written information to the pilot in command. As soon as possible the operator shall also provide this information to the appropriate authorities of the State of the Operator and the State in which the accident or serious incident occurred.

14.2.8 In the event of an aircraft incident, the operator of an aircraft carrying dangerous goods shall, if requested to do so, provide information without delay to the emergency services personnel responding to the incident and to the appropriate authority of the State in which the incident occurred, about the dangerous goods on board, as shown on the written information to the pilot-in-command.

Note: Additional guidance on the transportation of dangerous goods may be found in the IATA Dangerous Goods Regulations, and ICAO Annex 18.
15.0 Security

15.1 An operator shall establish, maintain and carry out a security programme that is proportional to the threat against the operator, its personnel, aircraft and facilities and the associated vulnerabilities and that meets the requirements of the State of the operator.

15.2 The security programme shall include a process to assess threats and vulnerabilities, preventive measures designed to reduce vulnerabilities and deter and prevent the commission of unlawful acts, responsive measures to be taken when an unlawful act has been committed against the operator, and appropriate training and testing of personnel involved.

Note 1: See IG 15.0 for guidance on operator security programmes. Also, the NBAA Best Practices for Business Aviation Security can be found at http://www.nbaa.org/ops/security/best-practices.

Note 2: Attachment B to IG 15.0 contains the NBAA Voluntary Security Protocol for Part 91 Operators. The NBAA Security Protocol was developed to serve as the NBAA recognized and Transportation Security Administration (TSA) endorsed standard for demonstrating an acceptable security protocol for Business Aviation. For latest amendments check with the NBAA.
# Appendix A: Terminology, Abbreviations and Acronyms

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<th>Acronym</th>
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<tr>
<td>ACAS</td>
<td>Airborne Collision Avoidance System</td>
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<td>AIP</td>
<td>Aeronautical Information Publication</td>
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<td>AMO</td>
<td>Approved Maintenance Organisation</td>
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<td>ANS</td>
<td>Air Navigation System</td>
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<td>ATC</td>
<td>Air Traffic Control</td>
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<td>ATPL</td>
<td>Airline Transport Pilot Licence</td>
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<td>ATS</td>
<td>Air Traffic Services</td>
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<td>BBGA</td>
<td>British Business and General Aviation Association</td>
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<tr>
<td>Cabin crew member</td>
<td>An aircraft crew member, other than a flight crew member, who has been assigned duties to be performed in the interest of the passengers on an aircraft.</td>
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<tr>
<td>CAM</td>
<td>Continuing Airworthiness Manager</td>
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<td>CAMO</td>
<td>Continuing Airworthiness Management Organisation</td>
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<td>CAME</td>
<td>Continuing Airworthiness Management Exposition</td>
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<tr>
<td>CAT II and III</td>
<td>Category II and III. Limits associated with a precision instrument approach system.</td>
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<tr>
<td>CDI</td>
<td>Course Deviation Indicator</td>
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<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
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<td>C of A</td>
<td>Certificate of Airworthiness</td>
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<td>C of R</td>
<td>Certificate of Registration</td>
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<td>CRM</td>
<td>Crew Resource Management</td>
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<tr>
<td>Dangerous Goods</td>
<td>Articles or substances which are capable of posing significant risk to health, safety or property when transported by air. Dangerous goods are classified in Annex 18, chapter 3.</td>
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<tr>
<td>EGPWS</td>
<td>Enhanced Ground Proximity Warning System</td>
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<td>ELT</td>
<td>Emergency Locator Transmitter</td>
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<td>ERS</td>
<td>Emergency Response Services</td>
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<td>FAA</td>
<td>Federal Aviation Administration of the USA</td>
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<td>Term</td>
<td>Definition</td>
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<tr>
<td>FATO</td>
<td>Final Approach and Take-off Area</td>
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<td>FIR</td>
<td>Flight Information Region</td>
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<td>Flight crew member</td>
<td>An aircraft crew member assigned to act as pilot or flight engineer of an aircraft during flight time.</td>
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<tr>
<td>Flight duty time</td>
<td>The period of time that starts when a flight crew member reports for a flight and finishes at the end of the flight when the aircraft engines are shut off.</td>
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<td>Flight Itinerary</td>
<td>Information regarding the route and duration of an intended flight that is filed with a person who will alert search and rescue if the flight becomes overdue.</td>
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<td>FMS</td>
<td>Flight Management System</td>
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<td>GM</td>
<td>Guidance material on meeting the requirements of a standard.</td>
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<td>GPWS</td>
<td>Ground Proximity Warning System</td>
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<td>HAI</td>
<td>Helicopter Association International</td>
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<tr>
<td>HAI</td>
<td>High Altitude Indoctrination</td>
</tr>
<tr>
<td>High Seas airspace</td>
<td>Airspace outside of the territory of a State.</td>
</tr>
<tr>
<td>Heliport</td>
<td>An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.</td>
</tr>
<tr>
<td>Hostile environment</td>
<td>An environment in which:</td>
</tr>
<tr>
<td></td>
<td>a. a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate; or</td>
</tr>
<tr>
<td></td>
<td>b. the helicopter occupants cannot be adequately protected from the elements; or</td>
</tr>
<tr>
<td></td>
<td>c. search and rescue response/capability is not provided consistent with anticipated exposure; or</td>
</tr>
<tr>
<td></td>
<td>d. there is an unacceptable risk of endangering persons or property on the ground.</td>
</tr>
<tr>
<td>hPa</td>
<td>Hectopascals of pressure</td>
</tr>
<tr>
<td>IBAC</td>
<td>International Business Aviation Council</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Organization</td>
</tr>
<tr>
<td>IFR</td>
<td>Instrument Flight Rules</td>
</tr>
<tr>
<td>ISO</td>
<td>International Standards Association</td>
</tr>
<tr>
<td>JAA</td>
<td>Joint Aviation Authority of the European Union</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>JAR OPS</td>
<td>Joint Aviation Regulations – Operations</td>
</tr>
<tr>
<td>JAR-FCL</td>
<td>Joint Aviation Regulation – Flight Crew Licensing</td>
</tr>
<tr>
<td>Local operation</td>
<td>Operation of helicopters with a maximum approved passenger seating configuration (MPSC) of 9 or less; by day; navigated over routes by reference to visual landmarks; and within a local and defined geographical area specified in the operations manual.</td>
</tr>
<tr>
<td>MEL</td>
<td>Minimum Equipment List</td>
</tr>
<tr>
<td>MNPS</td>
<td>Minimum Navigation Performance Specification</td>
</tr>
<tr>
<td>NAT</td>
<td>North Atlantic</td>
</tr>
<tr>
<td>NBAA</td>
<td>National Business Aviation Association</td>
</tr>
<tr>
<td>Non-complex helicopter operation</td>
<td>Operation of helicopters with a maximum certificated take-off mass (MCTOM) of 3 175 kg or less by day and navigated over routes by reference to visual landmarks.</td>
</tr>
<tr>
<td>NOTAM</td>
<td>Notice to Airmen</td>
</tr>
<tr>
<td>Offshore operations</td>
<td>Operations which routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations. Such operations include, but are not limited to, support of offshore oil, gas and mineral exploitation and sea-pilot transfer.</td>
</tr>
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</table>
| Operation | An activity or group of activities, which are subject to the same, or similar, hazards and which require a set of equipment to be specified, or the achievement and maintenance of a set of pilot competencies, to eliminate or mitigate the risk of such hazards.  
*Note.*—Such activities could include, but would not be limited to, offshore operations, heli-hoist operations or emergency medical service. |
| PBN | Performance-based Navigation |
| Performance-based navigation | Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.  
*Note.*—Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept. |
<p>| PF | Pilot flying |
| PIC | Pilot-in-Command |
| PM | Pilot monitoring |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>PNF</td>
<td>Pilot not flying</td>
</tr>
<tr>
<td>PPC</td>
<td>Pilot Proficiency Check</td>
</tr>
<tr>
<td>Procedure</td>
<td>A series of steps followed in a methodical manner to complete an activity – what shall be done and by whom, when, where, and how it shall be completed; what materials, equipment, and documentation shall be used, and how it shall be controlled.</td>
</tr>
<tr>
<td>Process</td>
<td>A system of activities that uses resources to transform inputs into outputs</td>
</tr>
<tr>
<td>Program</td>
<td>A plan of action aimed at accomplishing a clear business objective, with details on what work is to be done, by whom, when, and what means or resources will be used.</td>
</tr>
<tr>
<td>QFE</td>
<td>Height above airport or runway, local station pressure</td>
</tr>
<tr>
<td>QNH</td>
<td>Altitude above Mean Sea Level, local station pressure</td>
</tr>
<tr>
<td>RAIM</td>
<td>Receiver Autonomous Integrity Monitoring</td>
</tr>
<tr>
<td>RNAV</td>
<td>Area navigation</td>
</tr>
<tr>
<td>RNP</td>
<td>Required Navigation Performance</td>
</tr>
<tr>
<td>RVSM</td>
<td>Reduced Vertical Separation Minima</td>
</tr>
<tr>
<td>SAR</td>
<td>Search and Rescue</td>
</tr>
<tr>
<td>SIC</td>
<td>Second-in-Command or First Officer</td>
</tr>
<tr>
<td>SID</td>
<td>Standard Instrument Departure</td>
</tr>
<tr>
<td>SMS</td>
<td>Safety management system</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>STAR</td>
<td>Standard Arrival Route</td>
</tr>
<tr>
<td>State</td>
<td>A Contracting State of the Convention on International Civil Aviation</td>
</tr>
<tr>
<td>System</td>
<td>An organized, purposeful structure regarded as a whole and consisting of interrelated and interdependent. These elements continually influence one another (directly or indirectly) to maintain their activity and the existence of the system, in order to achieve the goal of the system</td>
</tr>
<tr>
<td>TAA</td>
<td>Technically advanced aircraft</td>
</tr>
<tr>
<td>Task specialist</td>
<td>A person, other than a flight crew member or a cabin crew member, who is assigned duties onboard an aircraft during flight time</td>
</tr>
<tr>
<td>TAWS</td>
<td>Terrain Awareness and Warning System</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>TCAS</td>
<td>Traffic Alert and Collision Avoidance System</td>
</tr>
<tr>
<td>TR</td>
<td>Type rating</td>
</tr>
<tr>
<td>VFR</td>
<td>Visual Flight Rules</td>
</tr>
<tr>
<td>VLJ</td>
<td>Very Light Jet</td>
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Appendix B: Implementation Guide

IS-BAO

IMPLEMENTATION GUIDE (IG)

3rd Edition (January 1, 2014)

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Tel: 1-514-954-8054 Fax: 1-514-954-6161
www.ibac.org
Foreword

This guidance material represents an evolution of design from IS-BAO Guidance Material (GM) to IS-BAO Implementation Guide (IG) to more effectively assist the operator in implementing the standards and recommended practices indicated in the IS-BAO. The information in this document links to specific standards or recommended practices and, therefore, the numbering system is identical to the IS-BAO.
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List of Effective Pages

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IG 3.0 Safety Management Systems

3.1 General

In addition to the SMS Toolkit which is provided with the IS-BAO, operators are encouraged to review a number of the many valuable references cited in this guidance material.

The goal of a safety management system is to manage safety risks to a level as low as reasonably practicable (ALARP). Safety management must be proactive and purposeful. It must also be appropriate. The nature and degree of safety management necessary (i.e. the safety requirement) should be determined by assessing the nature of the safety risks to which the flight operation is exposed. In other words, the safety-risks of an operation should be profiled to determine the appropriate level and focus of safety management. The safety management system is then tailored to proactively address the risks specific to an organization’s flight operation.

3.2 Safety Management System Requirements

The SMS Toolkit provides details on a safety management system and contains information on how a safety management system could be implemented and matured. The toolkit is comprised of a booklet and a CD (or flash-drive) that contains additional guidance material, forms, and other documents. Operators are encouraged to review the material on the stages of maturity of an SMS that is contained in the safety assurance and SMS evaluation material in the SMS Toolkit and in the IS-BAO Internal Audit Manual that is also provided with the IS-BAO.

3.2.1 Safety Policy and Objectives

a. Develop a Safety Policy that encompasses all eight items listed in the Standard.
   i. Reference: IS-BAO SMS Tool Kit; "ICAO Safety Policy Example" and "Safety Policy Examples".

b. Document safety responsibilities, accountabilities and authorities for everyone in the organization. Define the levels of management with authority to make decisions regarding safety risk tolerability.
   i. Reference: IS-BAO GCOM Chapter 1 "Organizational Structure" "Responsibilities and Accountabilities".

c. Appoint a Safety Manager.
   i. Reference: IS-BAO SMS Tool Kit; "Sample Safety Manager Appointment Letter".

d. Develop an Emergency Response Plan with integration of those organizations it must interface with during an emergency situation.
   i. Reference: IS-BAO SMS Tool Kit; Emergency Response Plan Tool" and "IS-BAO GCOM Chapter 5.4".

e. Develop an Implementation Plan for your SMS that includes all processes and procedures endorsed by senior management.
   i. Reference: IS-BAO SMS Tool Kit; "SMS Implementation Plan Example"
3.2.2 Safety Risk Management

a. Develop a formal process to identify hazards using reactive, proactive and predictive methods.

b. Develop a Company Safety Risk Profile of Operations and Maintenance and review it annually for changes to the operation that might drive changes to the FRAT or MRAT
   i. Reference: IS-BAO SMS Tool Kit; "Safety Risk Profile Tool"

c. Establish a Hazard Identification and Tracking System;
   i. Reference: IS-BAO SMS Tool Kit; "HITS Tool".

d. Develop an analysis, assessment and control method of your operational safety risks and record them to update your Company Safety Risk Profile or analyse the data for further risk determination.

e. Develop a Flight & Maintenance Risk Analysis Tool (FRAT & MRAT);
   i. Reference: IS-BAO SMS Tool Kit; "Operational Risk Analysis Tool" and "Technical Services Risk Assessment Tool".

NOTE: For identifying reactive hazards the operator should have a root cause analysis procedure.

3.2.3 Safety Assurance

a. Develop a process or procedure to monitor and measure safety performance.
   i. Set measurable Safety Goals annually and measure the performance of them.

b. Identify and manage major organizational changes that may affect safety.
   i. Reference: IS-BAO GCOM Chapter 2.4 "Change Management";
      ii. Conduct a risk analysis of the change event and an assessment of the changes required.

c. Ensure continuous SMS improvement.
   i. Establish and Internal Evaluation Program (IEP) utilizing the Internal Audit Manual
      ii. Reference. IS-BAO GCOM Chapter 2 - "Continuous Opportunity Improvement Form".

3.2.4 Safety Promotion

a. Develop and maintain a safety training program.
   i. Ensure all employees have been trained in SMS and receive re-current training annually.

b. Develop a means to formally communicate safety issues to all employees.
   i. Establish a Safety Committee and hold meetings with agendas
      ii. Record meeting minutes with action items and decisions made relative to agenda items
3.3 Compliance Monitoring

a. Establish a means for identifying applicable regulations, standards, approvals, exemptions and show compliance with them.

1. Update your Operations Manual annually with the updated IS-BAO standards and recommended practices.
2. Ensure your protocol references to your Operations Manual are updated appropriately
3. Perform an annual compliance assessment and share results with all personnel.

Techniques:

i. Develop a compliance matrix listing the associated regulatory requirements and the references in your manuals that address each requirement.

Other noteworthy web sites were SMS guidance material can be found include:


h. The FAA Safety Management System information at: [http://www.faa.gov/about/initiatives/sms/specifications_by_aviation_industry_type/](http://www.faa.gov/about/initiatives/sms/specifications_by_aviation_industry_type/).


IG 4.0 Organization and Personnel Requirements

4.1 Organization Structure

A recommended organization structure is as follows:

- **Owner, CEO or Accountable Executive**
- **Flight Department Manager/ Director, Flight Operations**
- **Safety Manager**
- **Operations Manager**
- **Maintenance Manager**
- **Scheduler/ Dispatcher**
- **Aircraft Crew Members**
- **Maintenance Staff**

4.1.1 Management Duties and Qualifications

It is important that the authorities and accountabilities, of the people within the organization be clearly defined. The following are the recommended accountabilities, duties and qualifications of the management and operating personnel. Operators should apply the structure, titles and terminology as appropriate to the size and nature of the operations and convention within their segment of the industry.

4.1.2 Owner, CEO or Accountable Executive

The owner, CEO or Accountable Executive is accountable for providing the resources required to conduct a safe operation and to implement and maintain the safety management system.

*Reference: See “Selection of the AEX” in the SMS Toolkit*

4.2 Aircraft Crew Member Duties and Responsibilities

4.2.1 Aviation Manager/Director

a. Responsibilities

The Aviation Manager/Director is accountable for overall operation of the flight operation, for the safety of the operation and that safety management goals are met. The duties of the position include:

1. organizing, staffing and directing:
i. flight operations,
ii. cabin safety,
iii. crew scheduling, and
iv. training programmes,
2. controlling operations and operational standards of all aircraft operated,
3. managing functions which impact on operational control (e.g. maintenance, crew scheduling, load control, equipment scheduling),
4. developing, implementing and maintaining the safety management systems,
5. developing and maintaining the company operations manual,
6. liaising with the regulatory authority on all matters concerning flight operations,
7. liaising with any external agencies which may affect aircraft operations,
8. ensuring that air operations are conducted in accordance with national and international regulations, standards and organization operating policies,
9. ensuring that crew scheduling complies with flight and duty time limitations,
10. ensuring that all crew members are kept informed of any changes to the regulations and operating standards,
11. receiving and taking action with respect to any aeronautical information affecting the safety of flight,
12. disseminating aircraft safety information, both internal and external,
13. ensuring that flight crew qualifications are current,
14. maintaining a current operations library, and
15. overseeing the welfare of flight operation personnel.

The foregoing can be assigned to other positions in the organization depending on its size and structure.

b. Qualifications

The flight department manager/director, flight operations must:
1. hold or have held an appropriate licence; or has acquired supervisory experience, and
2. demonstrate knowledge with respect to the operation of a flight organization, the content of the company operations manual, and the provision of the regulations and the standards necessary to carry out the duties and responsibilities to ensure safety.

4.2.2 Operations Manager/Chief Pilot

a. Responsibilities

The chief pilot is accountable to the flight department manager/director, flight operations for the professional standards of the flight crews under his/her authority, for implementing and maintaining related aspects of the safety management system and that operations and training safety management goals are met. The duties of the position include:
1. developing aircraft checklists and standard operating procedures,
2. developing and implementing all required approved training programmes for the operator flight crews,
3. issuing directives and notices to the flight crews as required,
4. ensuring that all aerodromes and routes served by the operator are operationally suitable and meet operator requirements,
5. taking action on and distributing accident, incident, and other occurrence reports,
6. processing and taking action on any flight crew reports,
7. supervising aircraft crews,
8. ensuring that all operations processes and procedures to include risk management mitigation specified in the safety management system,
9. ensuring that personnel under his/her authority participate effectively in the safety management system, and
10. assuming any responsibilities delegated by the flight department manager.

b. Qualifications

1. The chief pilot must:
   i. for aeroplanes hold a valid Airline Transport Pilot Licence valid for the category of aircraft operated.
   ii. for helicopters hold a commercial pilot licence valid for the category of aircraft operated.
   iii. if applicable, hold a type rating for at least one of the types of aircraft operated,
   iv. be qualified in accordance with the operator's training programme to act as a pilot-in-command on one of the types to be operated, and
   v. have knowledge of the content of the company operations manual, training manuals, SOPs (if applicable), operator check pilot manual (if applicable), and the provisions of the State civil aviation regulations and standards necessary to carry out the duties and responsibilities of the position.

4.2.3 Maintenance Manager/Chief of Maintenance

a. Responsibilities

The person responsible for maintenance is accountable for ensuring that all aircraft are maintained in accordance with the regulatory requirements, for implementing and maintaining related aspects of the safety management system and that all maintenance related safety management goals are met. The duties of the position include:

1. planning and controlling all aircraft maintenance,
2. liaising with the national civil aviation authority on maintenance topics,
3. liaising with all persons or approved maintenance organizations (AMOs) performing maintenance on the operator’s aircraft,
4. ensuring that aircraft maintenance records as required by State of Registry regulations, manufacturers and operator policies are established and maintained,
5. ensuring that airworthiness directives and service bulletins that affect operator’s aircraft are complied with appropriately,
6. removing from service any aircraft that are unsafe, or that do not comply with national regulatory requirements,
7. ensuring that all operations processes and procedures include risk management mitigation specified in the safety management system,
8. ensuring that personnel under his/her authority participate effectively in the safety management system, and
9. establishing safety policies and procedures for ground operations.
Note: For operators falling under EASA rules, the duties of the person responsible for the management for continuing airworthiness may be fulfilled by the CAMO. However, the ultimate responsibility for aircraft airworthiness remains with the owner/lessee/operator.

b. Qualifications

1. The person responsible for maintenance must have:
   i. knowledge of the planning, implementation and direction of the maintenance control system for the aircraft operated, and
   ii. knowledge of the national regulations and standards relating to aircraft maintenance.

4.2.4 Safety Manager

a. Responsibilities

The safety manager shall have direct access to the flight department manager/director, flight operations and unfettered access to the Accountable Executive, (owner, CEO or equivalent) in safety matters and shall be specifically be responsible for:

a. monitoring and advising on all operator safety activities that may have an impact on flight and ground safety,

b. establishing and managing the operator hazard identification and tracking system;

c. developing and maintaining a safety awareness programme,

d. monitoring industry flight safety concerns which may have an impact on operations,

e. maintaining close liaison with aircraft manufacturers and industry safety associations,

f. developing and maintaining the operator emergency response plan,

g. analysing hazard reports and other identified safety concerns and making recommendations on appropriate mitigation,

h. investigating and reporting on incidents/accidents and making recommendations on mitigation or modifications to the safety management system,

i. making recommendations to the operator senior management on matters pertaining to the safety management system,

j. undertaking safety assurance activities and conducting periodic evaluations of the safety management system and reporting the results management, and

k. monitoring the response and measuring the results of safety initiatives.

b. Qualifications

The safety manager must have:

a. extensive operational experience or equivalent experience in aviation management; and

b. training in the following:
   i. basic concepts of safety and accident causation,
   ii. safety management systems principles and practices,
   iii. the role of the safety manager as advisor to senior management,
iv. human factors and the decision making process,

v. accident prevention,

vi. risk management,

vii. accident/incident management,

viii. emergency response planning, and

ix. accident and incident investigation.

In smaller flight departments, the safety manager duties may be undertaken by the aviation manager or other qualified personnel.

4.2.5 Scheduler/Dispatcher

All organizations have someone responsible for scheduling the flights. In a small operation, these duties may be accomplished by the manager or assigned as collateral duties to the pilot or administrative personnel.

a. Some duties and responsibilities of this position could include:

1. scheduling travel for executives on operator aircraft or other lift alternatives such as charter,

2. providing the flight crew with the flight plan and weather information,

3. maintaining and updating aircraft and crew schedules to ensure compliance with operator and regulatory requirements,

4. obtaining international permits and visas and coordinating with outside aircraft service handlers for international flights, if applicable,

5. maintaining department records,

6. maintaining inventories of charts and related flight crew materials,

7. coordinating aircraft handling and fuelling with fixed base operators,

8. maintaining a flight following system,

9. coordinating maintenance on the aircraft,

10. developing and maintaining security policies or procedures and communicating these procedures as needed to passengers,

11. interfacing with flight crews, management, maintenance, and passengers,

12. scheduling ground transportation and accommodations,

13. arranging catering, and

b. Qualifications

The person responsible for scheduling the aircraft should have knowledge of the company operations manual and procedures, national and international (if applicable) regulations and standards, and the operator’s aircraft. The person should also have effective communication skills and defined methods to communicate to crewmembers, maintenance personnel and operator personnel. The position generally requires knowledge and skill with computer software.
4.2.6 Aircraft Crew Members

See the GCOM for example duties, responsibilities, and qualifications for aircraft crew members.

*Note: The NBAA Management Guide provides extensive information on qualifications and duties of other flight department personnel.*

4.2.7 Maintenance and Line Service Personnel

See the GCOM for example duties, responsibilities, and qualifications for maintenance personnel.

*Note: The NBAA Management Guide provides extensive information on qualifications and duties of maintenance department personnel.*

4.6 Use of Psychoactive Substances

See the GCOM for further guidance on the use of alcohol and other psychoactive substances.

4.7 Mobile Phone and Other Portable Electronic Devices (PED) - Reserved

4.8 Fatigue Risk Management Program

See the GCOM for further guidance on fatigue management.
IG 5.0 Training and Proficiency

5.1 Training Programmes

This IG provides guidance on complying with the requirements of section 5.1. All of the relevant items should be covered in initial training. The recurrent training programme should be designed so that key items are covered each year. All of the items that are relative to the conditions of a particular operation may be covered over a specific period of time if provided for in the State regulatory requirements.

NOTE: As the guidance provided in this IG is of a general nature, helicopter operators involved in specialized missions should incorporate the training requirements included in the applicable HAI Mission Specific Standards into their training programs.

Training Topics

2. Aircraft Ground Training

This training is to ensure that each flight crew member has knowledgeable of aircraft systems and all normal, abnormal, and emergency procedures. The following subjects should be included:

a. aircraft systems operation and limitations as contained in the aircraft flight manual and aircraft operating manual and standard operating procedures;
b. operation of all the aircraft equipment;
c. differences in equipment, operation, and layout between aircraft of the same type, if applicable;
d. normal, abnormal and emergency procedures for the aircraft;
e. aircraft performance and limitations;
f. weight/mass and balance system procedures;
g. MEL training (when a MEL has been established); and
h. aircraft servicing and ground handling.

For all aircraft, the use of an approved flight simulator and training devices in the training programme is most appropriate, where such are available.

3. Outsourced Training

The operator may contract crew member training to another organization where the following are met:

a. the training organization should use the manuals, publications, check lists, SOPs and other relevant documents used by the operator receiving the training;
b. aircraft training should be given on the same type and model as that used by the operator;
c. where there are differences between the aircraft and the simulator configuration, performance, systems or avionics, they should be covered by differences training;
d. the operator is responsible to ensure that the contracted training is conducted in accordance with their training programme; and

e. the operator should ensure that the State licensing requirements are met.
4. Simulator Training Programme for Pilots

The use of flight simulators for flight training is highly recommended. An operator with a programme that uses an approved Level C or higher simulator is normally permitted to conduct initial and upgrade training in the simulator. This level of simulator usually meets the requirements for recurrent and six month take-off and landing day/night currency requirements to carry passengers. Operators should confirm this with their State authority.

a. Content of Flight Simulator Training Programme

Flight simulator programmes should cover the following subjects as contained in the Aircraft Flight Manual and the aircraft operating manual used by the operator.

i. Procedures for normal, abnormal and emergency operation of the aircraft systems and components including:
   A. use of aircraft checklists;
   B. flight and cabin crew resource management training;
   C. aircraft fire on the ground and while airborne;
   D. engine fire or failure;
   E. effects of engine icing and anti-ice operation;
   F. take-off, landing and when applicable, flight with critical engine inoperative including driftdown and engine inoperative performance capabilities;
   G. loss of pressurization and emergency descent (as applicable);
   H. flight control failures and degraded states of operation;
   I. hydraulic, electrical and other system failures;
   J. failure of navigation and communication equipment;
   K. pilot incapacitation;
   L. approach to the stall (ground contact imminent and ground contact not a factor) (as applicable);
   M. normal and abnormal flight characteristics applicable to the aircraft category and type. These may include such items as: dutch roll, buffet boundary onset, jet upset, steep turns, static & dynamic rollovers, loss of tail rotor effectiveness, vortex ring, etc. (as applicable to the category, class and type of aircraft);
   N. aircraft performance for climb, cruise, holding, descent, landing and diversion;
   O. normal, noise abatement and maximum performance take-off;
   P. aircraft performance calculations, including take-off and landing speeds, weight and balance, height velocity curve, HOGE, settling with power, and centre of gravity (as applicable);
   Q. rejected take-off procedures and rejected landings;
   R. passenger and crew evacuation; and
   S. FMS, GPWS/TAWS, TCAS, ACAS and other specialized equipment installed in the aircraft, as applicable.
   T. Upset Training for unusual attitudes.
ii. Flight planning and instrument flight procedures:
   A. departure, en-route, holding, arrival and in-flight diversion;
   B. precision, non-precision and missed approaches in minimum visibility conditions;
   C. precision, non-precision and missed approaches using automatic, flight director and degraded states of operation;
   D. Category II and Category III approaches, as applicable; and
   E. testing and reviews.

Note: Operators should ensure that the training programme meets State flight crew licensing requirements.

b. Differences Training

Where the flight simulator has differences in performance, systems, avionics or cockpit layout and configuration from the operator's aircraft, such differences are to be listed in the training course outline and additional training on these differences may be required on the operator's specific aircraft configuration.

c. Level C Flight Simulators

When using an approved Level C flight simulator some States permit zero flight time training for candidates with previous experience on a similar aircraft type. “Similar aircraft type” refers to an aircraft possessing similar engine and complexity configuration such as the following relationship:

- Aeroplanes - turbo-jet to turbo-jet, turbo-prop to turbo-prop, or reciprocating engine to reciprocating engine.
- Helicopters – turbine to turbine engine.

All training and checking may be completed in a Level C flight simulator that duplicates the aircraft type and model flown by the operator. Operators should confirm this with their national civil aviation authority. Where the operator flies different models of the same type, provided the differences are limited and adequate differences training is provided, one type of flight simulator will normally be acceptable for training and checking on all the models.

In addition to the training required in section 6, the items specified below should also be included.

b. manoeuvring of the aircraft on the ground;

c. crosswind take-off and landings to 100% of the certificated crosswind component;

d. contaminated runway and crosswind take-off and landings to published demonstrated crosswind component (as applicable); and

e. a mix of no electronic aids, day, night and dusk visual circuits, approaches and landings. A visual flight training programme in the flight simulator is required to ensure visual flight skills are developed in the aircraft type. The training should cover the following using both day and night scenarios where the flight simulator capability permits:
   i. normal and crosswind take-offs, visual circuits and landings with variable winds, runway/heliport illusion and surface conditions;
   ii. engine inoperative approaches and landings;
   iii. engine failure procedures during take-off and missed approach;
   iv. no electronic aids approaches and landings;
   v. approach and landings with degraded flight controls (as applicable)
vi. slope take-off and landing (helicopters), and

vii. elevated heliports (helicopters).

d. **Level D Flight Simulators**

When using an approved Level D flight simulator, some States permit zero flight time training for candidates without previous aircraft experience in a similar type aircraft. To qualify, a pilot must hold a type endorsement for an aircraft requiring two pilots and have 1,000 hours pilot flight time. Operators should confirm this and its applicability for helicopters, with their State civil aviation authority.

For flight simulators that have minor differences in performance, systems, avionics or cockpit layout and configuration from the operator's aircraft, additional training on these differences should be provided in the aircraft.

4. **Aircraft only Flight Training Programme**

Where training has not been conducted in an approved simulator, the following flight training should be covered, as applicable.

Procedures for normal, abnormal and emergency operation of aircraft systems and components including:

- use of aircraft checklists;
- manoeuvring of the aircraft on the ground;
- crew resource management;
- simulated aircraft fire on the ground and while airborne;
- simulated engine fire or failure;
- briefings on effects of airframe and engine icing and anti-ice operation;
- take-off, landing and simulated flight with critical and two engine inoperative flight (3 or more engine aircraft as permitted by the aircraft flight manual) including driftdown and engine(s) inoperative performance capabilities (as applicable);
- simulated loss of pressurization and emergency descent (as applicable);
- simulated flight control failures and degraded states of operation, while in-flight, and during take-off and landing (as applicable);
- simulated hydraulic, electrical and other system failures;
- operation and simulated failure of navigation and communication equipment;
- pilot incapacitation;
- briefing for recognition and recovery from turbulence and windshear on approach, landing and take-off;
- normal and abnormal flight characteristics applicable to the aircraft type. These may include such items as: dutch roll, buffet boundary onset, jet upset, dynamic roll over (helicopters), steep turns, etc. (as applicable);
- aircraft performance for climb, cruise, descent, landing and diversion;
- normal, noise abatement and maximum performance take-off and landing;
- crosswind take-off and landings, and briefing on simulated contaminated runway take-off and landings;
- slope, confined area and pinnacle take-off and landings and elevated heliport operations as applicable for helicopters;
x. aircraft performance calculations, including take-off and landing speeds, weight and balance and centre of gravity;
y. simulated rejected take-offs and landings;
z. passenger and crew emergency evacuation; and
aa. FMS, GPWS/TAWS, TCAS, ACAS and other specialized equipment installed in the aircraft equipment, as applicable.

5. **Area Navigation Systems (RNAV) Training**

To qualify for use of RNAV systems on IFR operations, flight crew should undergo training in the following area and have a proficiency check by, or the person designated by, the chief pilot:

a. pre-flight;
b. normal operation of the system;
c. procedures for manually updating system;
d. methods of monitoring and cross checking system;
e. operation in area of compass unreliability;
f. malfunction procedures;
g. terminal procedures;
h. waypoint symbology, plotting procedures, record keeping duties/practices;
i. time keeping procedures; and
j. post-flight.


To qualify for operations in MNPS airspace, flight crew must have completed training for the appropriate MNPS airspace and have satisfactorily completed any proving flights or in flight checks, required by the State of Registry civil aviation authority.

The training normally required includes:

a. normal operating procedures, including navigation system pre-flight data entry and periodic cross-checking of system position display against aircraft position;
b. method of monitoring and cross-checking the system that is coupled to the auto-pilot;
c. action in the event of discrepancy between systems, method of determining which is the most accurate or reliable system;
d. radio communication procedures;
e. MNPS contingency procedures;
f. action in the event of single or multiple systems failure;
g. procedure for manual updating of systems;
h. airborne emergency procedures, including re-alignment (if applicable);
i. procedure for regaining track after deliberate or inadvertent deviation from cleared track;
j. RNAV training; and
k. RVSM training, if applicable.

7. **Reduced Vertical Separation Minima (RVSM) Training**

To qualify for operations in RVSM airspace, flight crew must have completed the appropriate training and have satisfactorily completed any proving flights or in flight checks, required by the State of Registry civil aviation authority. The training normally required includes:

a. Floor, ceiling and horizontal boundaries of the RVSM airspace to be operated in;
b. Policy on exclusion of aircraft not RVSM approved;
c. Pilot procedures:
   i. pre-flight and in-flight altimeter checks;
   ii. use of the automatic altitude control system;
   iii. Minimum Equipment List (MEL) for RVSM operations;
   iv. special procedures for in-flight contingencies;
   v. updated weather deviation procedures;
   vi. track offset procedures for wake turbulence and nuisance aircraft systems alerts; and
   vii. pilot level-off call.
d. Procedures for flight of non-RVSM compliant aircraft for maintenance, humanitarian and delivery flights; and
e. Use of ACAS/TCAS

Note: Reference material is contained in UK CAA AIC 80/2000 – RVSM Operations – Flight Crew Training and Operational Considerations

8. Required Navigation Performance (RNP) Training

To qualify for operations in RNP airspace, flight crew must have completed training for the particular RNP airspace and have satisfactorily completed any proving flights or in flight checks, required by the State of Registry civil aviation authority. The training normally required includes:
a. flight planning considerations for that RNP airspace;
b. navigation performance requirements for that RNP airspace;
c. enroute procedures for that RNP airspace; and
d. contingency procedures for that RNP airspace.

9. Category II/III Operations

The operator must meet the training and currency specified by the State of Registry civil aviation authority. In the absence of specific national rules, the operator should meet the requirements of:
   - FAA Circular AC 91-16 - Category II Operations - General Aviation Airplanes for Category II,
   - FAA Circular - AC 120-28D - Criteria for Approval of Category III Weather Minima for Takeoff, Landing, and Rollout for Category III operations,
   - JAR-OPS 1 - Commercial Air Transportation (Aeroplanes) Subpart E – All Weather Operations, and

10. Low Visibility Take-off Weather Minima

a. Ground Training:
   i. take-off alternate requirements,
   ii. pilot-in-command minimum experience,
   iii. pilot-in-command responsibility for visibility and obstacle clearance requirements, and
   iv. minimum aircraft and runway equipment requirements.
b. Flight Simulator Training (RVR 600 ft./200 m only):
   1. one completed take-off at RVR 600 ft./200 m, and
   2. one rejected take-off at RVR 600 ft./200 m that will include an engine failure.
The above training is required for the pilot-in-command only, except if the operator authorizes a co-pilot to conduct take-offs in lower-than-standard weather minima, the co-pilot shall undergo the same training as the pilot-in-command.

11. Upgrade Training for Pilots

Upgrade training to pilot-in-command for pilots who have qualified and served as a co-pilot on that aircraft type should include the following:

a. Crew Resource Management;

b. training in and demonstration of proficiency as a pilot-in-command from both left and right seats (if PIC flies in both seats) in all areas of aircraft handling and operation as outlined in the in the initial course; and

c. special authorization qualification (e.g. lower take-off limits, etc.).

12. Engine-out Take-off and Ferry

Where an operator wishes to obtain authority for engine-out ferry, the training as specified in the manufacturer’s aircraft operating manual shall be completed in the simulator prior to making application for a special flight authority.

13. Transportability of Pilot Proficiency Check - Training

Transportability of pilot training and proficiency checks from one operator to another is normally permitted subject to the new operator providing the following training, which shall be specified in the company operations manual:

a. company operations manual;

b. normal, abnormal and emergency procedures on each type of aircraft the pilot is assigned to fly; and

c. pilot ground training on each type of aircraft the pilot is assigned to fly, sufficient to cover the operator procedures, equipment differences and special authorizations.

14. Aircraft Surface Contamination Training

Operating personnel should receive training in the following areas:

a. aircraft crew initial de-icing/anti-icing training;
   1. the effect of contamination on a critical surface;
   2. aircraft de-icing/anti-icing procedures; and
   3. aircraft inspection procedures;

b. aircraft crew recurrent de-icing/anti-icing operational procedures training every two years;

c. initial de-icing/anti-icing, ground/maintenance personnel training; including:
   1. the effect of contamination on critical surfaces;
   2. aircraft de-icing/anti-icing procedures; and
   3. aircraft inspection procedures; and

d. recurrent de-icing/anti-icing ground maintenance procedures training every two years.
15. MEL Training (as applicable)

Where an operator uses an MEL, flight crew should receive training such as:

a. MEL Origin and Philosophy:
   1. difference between a MMEL and a MEL, and
   2. MEL Background and development.

b. General MEL Content:
   1. approval letter,
   2. list of effective pages,
   3. table of contents,
   4. preamble,
   5. definitions, and
   6. ATA Chapters, Page format, Page numbering, System and item titles, categorization, columns, remarks and exceptions, placarding, (O) and (M) procedures.

c. Specific Use of the MEL:
   1. a review of items from a variety of systems including those with no procedures, (O), (M), (M#), (O) and (M), as applicable,
   2. practical demonstration of MEL use versus hypothetical situations at and away from a maintenance base, and
   3. supervised 'hands on' use of a MEL, until familiar with the location, contents and procedures, including those at or away from a maintenance base.

16. Carriage of Dangerous Goods and Magnetized Material Training (if applicable)

If the operator is engaged in the carriage of cargo pursuant to national or IATA Transportation of Dangerous Goods Regulations, the required training programme must cover at least:

a. general philosophy of dangerous goods;

b. (State) Transportation of Dangerous Goods regulations;

c. the current edition of the ICAO Technical Instructions;

d. limitations;

e. general requirements for shippers;

f. classes and lists of dangerous goods;

g. packing requirements;

h. labelling and marking;

i. dangerous goods documentation, including shipper’s declaration, pilot notification and acceptance checklist forms;

j. operator acceptance, rejection, handling and storage procedures;

k. recognition of undeclared dangerous goods;

l. storage and handling procedures including loading and unloading procedures and segregation requirements;

m. provisions for passengers and crew; and

n. operator emergency procedures.

If an operator does not carry dangerous goods, crewmembers shall receive training on the following subjects initially and every two years thereafter:
a. dangerous goods recognition
b. procedures for advising passengers on what constitutes dangerous goods
c. what and how certain dangerous goods can be carried onboard the aircraft

17. Flight Dispatcher Specific Training (as applicable)

Where an operator chooses to use an Operational Control System (OCS) of a type that within the State regulatory system requires a licensed dispatcher, the person(s) assigned these duties should hold the licence and receive the training specified by the State authority.

18. Scheduler/Flight Coordinator Training

Schedulers or other Flight Coordinator personnel should receive training commensurate with their assigned duties and responsibilities. These duties and responsibilities can vary dependent on the size and complexity of the organization. Generally, training should include:

a. operator aircraft including performance, weight/mass and balance;
b. company operations manual;
c. national regulations and international standards, if applicable;
d. computer/ software training; and
e. CRM/ human factors.

19. Other Persons Assigned Onboard Duties

Where an operator has assigned onboard duties to those other than flight crew or cabin crew member, that person must be given adequate initial and annual training to perform the procedures relevant to the duties with which the person is to be involved including:

a. authority of the pilot-in-command;
b. means of communication;
c. a general description of the aircraft and systems which the person may use;
d. procedures for normal, abnormal, and emergency situations;
e. location, operation and use of emergency, life saving and survival equipment carried; and
f. the relationship of their duties to those of the other crew members.

20. Operational Ground Support Personnel

Personnel involved in ground support of helicopter operations should receive training commensurate with their assigned duties and responsibilities. The duties may vary depending on the type of operation but the training should generally include:

1. Passenger and landing zone management;
2. Load preparation and handling;
3. Hazardous materials;
4. Operation of doors, cargo hatches, cargo securing, etc.;
5. Helipad and drop zones housekeeping;
6. Marshalling and other communications with flight crew;
7. Training of standard phraseology for radio communications (remote base ops);
8. Managing static electricity;
9. Correct hook-up procedures and use of external cargo equipment;
10. Aviation hazards, e.g. electrical lines, trees, foreign obstacles, etc.;
11. Requirement for control under the aircraft;
a. Actions in the event of an aircraft emergency,
b. Procedures for positioning a load suspended on a long line,
c. Use absolute minimum number of people,

12. Required personnel protective equipment and proper use;
13. First aid and fire fighting (not to exceed 2 years between training);
14. Refuelling Procedures to include procedures for hot refuelling;
15. Human Factors;
16. Fatigue Management; and
17. FOD Training.

21. VNAV Approaches

The VNAV training programme should provide sufficient training (e.g. simulator, training device, or aircraft) on the aircraft’s VNAV capability to the extent that the pilots are not just task-oriented, including:

a. the basic principles of VNAV;
b. the meaning and proper use of aircraft systems;
c. procedure characteristics, as determined from chart depiction and textual description:
   i. depiction of waypoint types (flyover and fly-by) and path terminators and any other types used by the operator) as well as associated aircraft flight paths;
   ii. RNAV system-specific information;
   iii. levels of automation, mode annunciations, changes, alerts, interactions, reversions, and degradation;
   iv. functional integration with other aircraft systems;
   v. the meaning and appropriateness of vertical path discontinuities as well as related flight crew procedures;
   vi. monitoring procedures for each phase of flight (e.g. monitor “PROGRESS” or “LEGS” page);
   vii. turn anticipation with consideration to speed and altitude effects; and
   viii. interpretation of electronic displays and symbols.
d. VNAV equipment operating procedures, as applicable, including how to perform the following actions:
   i. adhere to speed and/or altitude constraints associated with an approach procedure;
   ii. verify waypoints and flight plan programming;
   iii. fly direct to a waypoint;
   iv. determine vertical-track error/deviation;
   v. insert and delete route discontinuity;
   vi. change arrival airport and alternate airport; and
   vii. contingency procedures for VNAV failures;
e. there should be a clear understanding of crew requirements for:
   i. comparisons to primary altimeter information;
   ii. altitude cross-checks (e.g. altimetry comparisons of 30 m (100 ft));
   iii. temperature limitations for instrument procedures using VNAV; and
   iv. procedures for altimeter settings for approach; and
f. discontinuation of a procedure based upon loss of systems or performance and flight conditions, e.g. inability to maintain required path tracking, loss of required guidance, etc.

22. Training Staff

The recommended standard for training programmes, training facilities and for instructors of ground training programmes follows.

a. Training Facilities should have an environment conducive to learning and take into consideration, privacy, furnishings, audio-visual requirements and current training aids.

b. Instructional Staff - The competence of instructional personnel should be in accordance with procedures and to a level acceptable to the Licensing Authority. Flight instructors must hold the licence and ratings appropriate to the aircraft type and ground training instructor should have relevant technical expertise.

c. All instructional personnel should receive initial and continuation training appropriate to their assigned tasks and responsibilities. Their training programme should include
   a. the teaching/learning process,
   b. instructional technique,
   c. student/instructor relationship training in knowledge and
   d. skills related to human performance.

23. Scheduler/Dispatcher Personnel Training Program

a. The operator should establish and maintain training programs that are designed to ensure all scheduling and dispatching personnel have the competencies appropriate to the level of scheduling performed.

b. The operator should ensure that the training programs have been established, either through or a combination of an internal program, training service provider, NBAA PDP and/or CAM accredited curriculum or international equivalent.

c. The training program should include initial and recurrent training appropriate to the operations.

d. The training program should include subjects such as:
   i. Operator policy and procedures;
   ii. Computer skills and scheduling software application;
   iii. Aircraft performance and weather;
   iv. Fatigue management/Human factors;
   v. Safety Management Systems;
   vi. Emergency Response;
   vii. Leadership and team work;
   viii. Federal Aviation Regulations (FARs) and International Regulations;
   ix. Interpersonal skills and effective communication; and
   x. CPR and hangar safety.
IG 6.0 Flight Operations

Standard Operating Procedures

The Standard Operating Procedures (SOP) should contain the following information for each type of aircraft operated. Where there are significant differences in equipment and procedures between aircraft of the same type operated, the SOP should show the registration mark of the aircraft, it is applicable to. The SOP may be a stand-alone document or may be incorporated into the company operations manual.

Recommended Contents of a SOP

1. table of contents;
2. list of effective pages;
3. amending procedure;
4. communications;
5. crew coordination;
6. use of check lists;
7. standard briefings;
8. standard calls;
9. radio procedures;
10. Normal procedures:
   a. battery/APU engine starts,
   b. taxi,
   c. power check (helicopters),
   d. take-off and climb,
   e. cruise,
   f. descent,
   g. calculations of landing performance at increased altitudes (helicopters),
   h. instrument approach procedures and circling, arrival and departure procedures at controlled and uncontrolled airports,
   i. landing,
   j. refuelling with passengers onboard (if permitted), and
   k. use of onboard navigation and alerting aids;
11. Abnormal procedures:
   a. rejected take-off,
   b. missed approaches and balked landing procedures,
   c. stall recovery (aeroplanes),
   d. loss of tail rotor effectiveness (helicopters),
   e. tail rotor drive failure and stuck pedals (helicopters),
   f. dynamic rollover (helicopters), and
   g. autorotation (helicopters);
12. Emergencies:
   a. pilot incapacitation; (2 pilot crew),
   b. bomb threat and hijacking,
   c. engine fire/failure/shutdown,
   d. fire, internal/external,
   e. smoke removal,
   f. rapid decompression (aeroplanes as applicable,
   g. flapless approach and landing (aeroplanes); and
h. check lists;

13. Other operating considerations:
   a. cold weather operations,
   b. helicopter vertical reference (helicopters),
   c. remote landing sites (helicopters),
   d. night operations (helicopters),
   e. slope landings and take-offs (helicopters),
   f. passenger loading and unloading on slopes,
   g. flight into degraded visual environments; and
   h. ACAS procedures.

14. Mission specific requirements (helicopters as applicable):
   a. offshore platform,
   b. general boat/ship,
   c. volcanic / seismic,
   d. utilities patrol and construction,
   e. emergency medical services,
   f. search and rescue,
   g. law enforcement support,
   h. heli skiing,
   i. aerial fire fighting,
   j. aerial application,
   k. electronic news gathering, and
   l. other.

The NBAA PROTOTYPICAL Business Aviation Safety Program Manual that can be found at http://www.nbaa.org/ops/safety/manual/ contains extensive guidance material that may be of assistance to operators in developing either fixed wing or rotary wing standard operating procedures manuals.


The Multi Crew Aircraft Standard Operating Procedures that can be found on the Transport Canada web site at http://www.tc.gc.ca/CivilAviation/commerce/manuals/multicrewSOP/menu.htm is a very comprehensive SOP model.

Also, aircraft manufacturers and flight training organizations may be a source of assistance in developing a SOP manual.

The Helicopter Association International (HAI) has produced mission specific standards. Information on these standards can be found at http://www.rotor.com.
Runway Incursion Prevention Best Practices

(Based on material from ICAO Doc 9870 Manual for Preventing Runway Incursions)

The taxi phase should be treated as a “critical phase of flight”.

The important elements of runway incursions prevention are:

a. It is essential to adhere strictly to all relevant ICAO Standards and Recommended Practices, Procedures and guidance material, including phraseologies;

b. Flight crews need to ensure that they follow the clearance or instructions that are actually received, and not those that the flight crew is expecting to receive;

c. Good planning of ground operations can decrease the workload during taxi. The flight and its associated risks starts during the preparation;

d. Good situational awareness is the top priority during taxi. All crewmembers should be involved;

e. Application of “Crew Resource Management” principles during taxi is as important as during other phases of flight;

f. Even the most professional and experienced people make mistakes. By being defensive and letting the built-in safety nets do their work, a single mistake should not lead to a serious incident or accident;

g. For helicopters, runway incursions can also occur both during air or ground taxiing and when operating in close proximity to runway environments. Close proximity also relates to in flight when transiting an airport’s runway environment. Uncontrolled airports pose just as serious threats to incursions as do controlled airports; and

h. Never take anything for granted.

For additional guidance material that may be used in SOP development please see ICAO Doc 9870 Manual for Preventing Runway Incursions. It is available from ICAO in print format or in electronic format at http://www.icao.int/FSIX/_Library/Runway%20Incursion%20Manual-final_full_fsix.pdf.

Excerpts are available through the IBAC website at the following link: http://ibac.org/Files/Safety/preventing_runway_incursions.pdf.

Additional guidance material is available at the FAA website at http://www.faa.gov/airports/runway_safety/.

6.13 Fatigue Management System

Introduction

This IG presents material that operators may use to develop fatigue management programs for operations and maintenance personnel. The principles contained in this material are such that they can be applied to other personnel involved in the operation. Four primary sources were used for this guidance material. For aircraft crew, the Flight Safety Foundation Fatigue Countermeasures Task Force report Principles and Guidelines for Duty and Rest Scheduling in Corporate and Business Aviation, published by the Flight Safety Foundation in February 1997, was used. For aircraft maintenance personnel, the March 2003 UK CAA Paper 2002/06: Work Hours of Aircraft Maintenance Personnel and the Transport Canada report Assessment of Aircraft Maintenance Engineers (AMEs) Hours of Work were used. Training considerations were derived from the foregoing documents plus the NASA Ames publication Crew Factors in Flight Operations XV: Alertness Management in General Aviation Education Module.
Operators are encouraged to obtain these documents to assist them in developing their flight and duty time limitations and fatigue management programme. The documents may be downloaded at:

- UK CAA paper [http://www.caa.co.uk/docs/33/PAPER2002_6.PDF](http://www.caa.co.uk/docs/33/PAPER2002_6.PDF)
- Transport Canada [http://www.tc.gc.ca/eng/civilaviation/standards/sms-frms-menu-634.htm](http://www.tc.gc.ca/eng/civilaviation/standards/sms-frms-menu-634.htm), and
- NASA [http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20120009910_2012008989.pdf](http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20120009910_2012008989.pdf)

**Global Consideration**

Fatigue is related to a variety of operational experiences, for example, physical discomfort after overworking a particular group of muscles, concentration difficulties during a monotonous task, after being exposed to long or irregular work hours encountering slowed reaction time, difficulty appreciating potentially important but subtle indications that an undesirable situation may be developing, or simply difficulty staying awake. Fatigue becomes important when it reduces efficiency or otherwise degrades performance and affects individuals both subjectively and physiologically. Physiological fatigue results from lost sleep and can only be rectified by sleep itself. Subjective fatigue can be affected by motivation or by the amount of stimulation coming from the environment and is often poorly detected by individuals.\(^1\)

Fatigue is a hazard faced by most aviation operations. Research clearly indicates that fatigue is an issue across all segments of aviation, not only in long haul flights that involve significant time zone changes\(^2\). The data shows that different flight operations and work schedules create different physiological disruptions and can engender fatigue in somewhat different ways. However, there are four core operational factors that must be considered in fatigue countermeasures programs.

a. Duty period length is related to the continuous hours of wakefulness through a subset. Flight time is a subset of duty period.

b. Rest or off-duty periods, are related to sleep opportunity and can affect both acute sleep loss and the creation of a cumulative sleep debt.

c. Circadian factors can affect both alertness and performance during operations as well as the quantity and quality of sleep obtained during rest periods.

d. Cumulative effects can be relevant for continuous and consecutive duty periods and an accumulated sleep debt.

Working conditions, the physical environment and operator workload can also contribute to fatigue. While a limited scientific literature is available, environmental factors such as vibration, noise and temperature may further contribute to operator fatigue in rotorcraft operations.

The risks normally associated with this hazard are mistakes, incidents and accidents. Strategies to manage this hazard and the associated risks should be developed by operators and included in their safety management system. The management strategies should include processes to involve all employees, and include:

a. Scientifically-based training and education for everyone in the organization including scheduling staff on the physiological mechanisms that underlie fatigue (including sleep

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fundamentals and circadian rhythms), the misconceptions about fatigue, causes of fatigue (including medical conditions that may lead to fatigue), the effects of fatigue on performance, and fatigue countermeasures,

b. Flight and duty time limits based on sound scientific research,
c. Scheduling practices that carefully consider the safety-risks associated with fatigue and its cumulative effects,
d. Mechanisms that ensure that employees report on situations where fatigue became an issue,
e. Processes to empirically analyse all reports considering core physiological factors, and provide feedback to employees and effect change to preclude future occurrences (e.g., safety bulletins, lessons learned, recurrent training).

The employee reporting, analysis and feedback mechanisms should be a component of the organization’s safety management system.

The UK CAA in cooperation with QinetiQ Centre for Human Sciences and a number of airlines, has developed a computer based system called SAFE - System for Aircrew Fatigue Evaluation to analyze and predict crew fatigue for a flight or a series of flights. In its present form, SAFE can provide a valuable addition to the tools available to the regulator for the assessment of aircrew rosters. This has been demonstrated by its contribution to the evaluation of the requirements for crew augmentation in the new generation of ultra-long range aircraft. See [http://www.caa.co.uk/docs/33/CAAPaper2005_04.pdf](http://www.caa.co.uk/docs/33/CAAPaper2005_04.pdf).

**Aeroplane Crew Considerations**

The Flight Safety Foundation guidelines were developed by a task force that worked closely with scientists at the U.S. National Aeronautics and Space Administration’s Ames Research Center. They looked into such issues as circadian physiology, off-duty periods, duty periods and flight time along with education and training issues. The Task force was comprised of 30 representatives of operators, aircraft manufactures, and training suppliers. They relied extensively on research from the Flight Management and Human Factors Division of the NASA-Ames Fatigue Countermeasures Program.

Tables 1 and 2 presents highlights of the report. Operators are encouraged to obtain and review the full report.

**Relevant Definitions**

**Window of Circadian Low**

The window of circadian low is best estimated by the hours between 0200 and 0600 for individuals adapted to a usual day-wake/night-sleep schedule. This estimate is calculated from scientific data on the circadian low of performance, alertness, subjective report (i.e., peak fatigue) and body temperature. For duty periods that cross three or fewer time zones, the window of circadian low is estimated to be 0200 to 0600 home-base/domicile time. For duty periods that cross four or more time zones, the window of circadian low is estimated to be 0200 to 0600 home-base/domicile time for the first 48 hours only. After a crew member remains more than 48 hours away from home-base/domicile, the window of circadian low is estimated to be 0200 to 0600 local time at the point of departure. Recommended

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guidelines related to the window of circadian low should be applied when any of the following operations occur: landing within the window; flight through both sides of the window; or duty period that starts at 0400 or earlier within the window.

**Off Duty** is a continuous, predefined period of uninterrupted time during which a crew member is free of all duties.

**Duty** is any task a crew member is required to perform by the operator, including flight time, administrative work, managerial duties, training and deadheading.

**Duty period** is a continuous period of time during which tasks are performed for the operator; determined from report time until free from all required tasks.

**Flight time** is the sum of all flight time, calculated from block to block for each flight segment.

**Standby** A flight crew member on “standby” is required to be available to an operator (away from the airport) for assignment to a flight duty period.
# Table 1

**Flight Safety Fatigue Countermeasures Task Force**  
**Overview of Guidelines and Recommendations for Corporate and Business Aviation**

<table>
<thead>
<tr>
<th>Off Duty</th>
<th>Duty Period</th>
<th>Flight Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per 24-hour Period</td>
<td>Per Week</td>
<td>Other</td>
</tr>
<tr>
<td>Two Pilots</td>
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<tr>
<td>10 hours</td>
<td>Minimum 36 continuous hours, including two consecutive recovery nights, in a seven-day period (calculated on a seven-day or 168-hour rolling basis)</td>
<td>48 continuous hours on return home following duty period across multiple time zones</td>
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<tr>
<th>Off Duty</th>
<th>Duty Period</th>
<th>Flight Time</th>
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<tbody>
<tr>
<td>Per 24-hour Period</td>
<td>Per Week</td>
<td>Other</td>
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<tr>
<td>Three Pilots (Augmented)</td>
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<tr>
<td>12 hours</td>
<td>Same as above</td>
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<td>12 hours</td>
<td>Same as above</td>
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</tbody>
</table>

* Extended operations can involve duty/rest cycles longer than 24 hours.  
** Each flight crew gets maximum sleep opportunity with minimum four hours total; maximum two consecutive duty periods with 18 hours off duty.

Source: Flight Safety Foundation and U.S. National Aeronautics and Space Administration  
Included with the permission the Flight Safety Foundation
Table 2
Flights Safety Fatigue Countermeasures Task Force
Overview of Guidelines and Recommendations for Flight Operations During the Window of Circadian Low

The “window of circadian low” is best estimated to be the hours between 0200 and 0600 for individuals adapted to a usual day-wake/night-sleep schedule. Guidelines apply to the following operations within this window of circadian low:
1. Landing
2. Flight through both sides of the window of circadian low
3. Duty period that starts at 0400 or earlier in the window of circadian low

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<th>Off Duty</th>
<th>Duty Period</th>
<th>Flight Time</th>
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<td>Two Pilots</td>
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<tr>
<td>Per 24-hour Period</td>
<td>Per Week</td>
<td>Other</td>
<td>Weekly,</td>
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<tr>
<td>12 hours</td>
<td></td>
<td>48 continuous hours in seven-day period following multiple duty periods in circadian low (calculated on a seven-day or 168-hour rolling basis)</td>
<td>48 continuous hours on return home following duty period across multiple time zones</td>
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<tr>
<td>No two pilot extensions recommended</td>
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<tr>
<td>Three Pilots (Augmented)</td>
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<td></td>
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<tr>
<td>Per 24-hour Period</td>
<td>Per Week</td>
<td>Other</td>
<td>Weekly,</td>
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<td>12 hours</td>
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<td>Monthly,</td>
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<tr>
<td>12 hours</td>
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<td>Same as above</td>
<td>Monthly,</td>
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<tr>
<td>12 hours</td>
<td></td>
<td>Reclining seat 18 hours</td>
<td>Monthly,</td>
</tr>
<tr>
<td>12 hours</td>
<td></td>
<td>Supine bunk 20 hours</td>
<td>Monthly,</td>
</tr>
</tbody>
</table>

* Extended operations can involve duty/rest cycles longer than 24 hours.
** Each flight crew gets maximum sleep opportunity with minimum four hours total; maximum two consecutive duty periods with 18 hours off duty.

Source: Flight Safety Foundation and U.S. National Aeronautics and Space Administration
Included with the permission the Flight Safety Foundation
Helicopter Crew Consideration

Given the wide variety of helicopter operations and related conditions it has been concluded that it is not appropriate to propose any recommended flight and duty time limits. Such limits may be included in the helicopter mission specific standards where deemed appropriate. Guidance material of a more general nature on helicopter fatigue issues includes:

- Flight Crew Fatigue III: North Sea Helicopter Air Transport Operations at
- International Association of Oil and Gas Producers, Helicopter Guidelines for Land Seismic & Helirig Operations, Appendix H Fatigue Management Programs at:
- US Army Combat Readiness/Safety Center Crew Endurance Leader’s Guide at:
- Scholarly Paper published by The International Journal of Aviation Psychology, “Flight-Related Musculoskeletal Pain and Discomfort in General Aviation Pilots From the United Kingdom and Ireland”

Aircraft Maintenance Personnel Considerations

The UK CAA Paper 2002/06: Work Hours of Aircraft Maintenance Personnel, was developed by Simon Folkard D.Sc. of the Body Rhythms and Shiftwork Centre, Department of Psychology, University of Wales. In his work Dr Folkard conducted an extensive review of literature on the impact of various aspects of work hours on health, sleep, fatigue and safety, with special emphasis being given to safety considerations. In addition, a large scale survey was undertaken of licensed aircraft maintenance engineers in the UK and parallel surveys of employers and contract employers were also conducted. The paper presents information on hours of work and fatigue related safety and health issues. It also provides data on the increased levels of risk associated with fatigue and hours of work. The paper concludes with guidelines for “Good Practices”. The guidelines were based on the available evidence relating these features to sleep and/or fatigue. The aims have been threefold, namely to:

a. Minimise the build-up of fatigue over periods of work
b. Maximise the dissipation of fatigue over periods of rest
c. Minimise sleep problems and circadian disruption

Operators are encouraged to obtain and review the full report.

In developing their fatigue management system for aircraft maintenance personnel operators may wish to consider the following items.

a. **Work Schedules**

   b. The data indicates that the level of risk associated with errors and accidents increases after 8 hours and increases dramatically after working more than 12 hours.
• The nature of tasks undertaken during the latter portions of work schedules should be considered. Levels of risk may be reduced during such periods by having persons who are in the early portion of their work schedule assist with work and provide quality control.

• Provisions for eight hours prone rest should be provided. Time between work schedules should take this, travel time and personal time into account, especially when overtime work is involved.

• In order to reduce fatigue build-up regular breaks should be integrated into work schedules.

• The scheduling system should include a maximum work hour duration limitation for each work shift. The system should also include a process for assessing extended work periods and to make decisions to terminate or continue the work shift. The process should require the assessment and decision to be documented. It should include training so that the system and expectations are clearly understood by all persons involved.

b. Night Shifts
   1. Levels of risk increase significantly with successive night shifts. Limits on successive night shifts, their end time and required rest periods at the end of a series of night shifts should be considered.

c. Morning/Day Shifts
   1. As early morning starts can disrupt rest periods consideration should be given to reducing the shift duration when early starts are involved. Also the nature of work performed at the end of early start shifts should be considered.
   2. Limits on the number of successive early start shifts should also be considered.

d. Weekly Limits
   1. As fatigue accumulates over successive work periods weekly work limits should be established.
   2. In order to relieve fatigue build-up associated with night shifts or early morning starts, a scheme such as a weekly rest period of two successive recovery nights in a seven day period should be considered.

e. Additional Considerations
   1. Educational programmes should be developed to increase the awareness of aircraft maintenance personnel of the issues associated with fatigue. In particular, it is important to draw their attention to the objective trends in risk with a view to increasing their vigilance at points when risk may be high despite the fact that perceived fatigue level may not be. It is also important to provide information on how to plan for night work, and to give guidance on the health risks which seem to be associated with shift work, particularly at night.
   2. Aircraft maintenance personnel should be required to report for duty adequately rested.

Scheduling and Dispatch Personnel Considerations

Personnel involved in scheduling and dispatch should be trained in the management of fatigue and the critical role that they can play.

Additional References

Additional material on fatigue management is available from the following sources:
An International Standard for Business Aircraft Operations

Appendix B: Implementation Guide (IG)

- Alertness Solutions provides fatigue management products, services and tools and has a number of research papers and other educational materials at http://www.alertness-solutions.com/ that would be of use to operators.

- NASA Ames Research Center Human Factors Research and Technology Division has a wealth of flight crew fatigue countermeasure related studies and papers at on their website at http://human-factors.arc.nasa.gov/


- Naval Aerospace Medicine Institute at: http://www.operationalmedicine.org/Powerpoint/NAMI/AeromedicalBriefs.htm


- UK CAA CAP 371 The Avoidance of Fatigue in Aircrews at: http://www.caa.co.uk/docs/33/CAP371.PDF

6.14  Travel Health Issues

See the following links for travel health guidance.

U.S. State Department:  http://travel.state.gov/travel/tips/tips_1232.html#health

U.S. Center for Disease Control: http://wwwnc.cdc.gov/travel/

6.21  Stabilized Approaches

A stabilized approach is one of the most critical elements of a safe approach and landing operation. An approach is considered stabilized when all of the following conditions are met:

a. The landing gear is down, landing flaps set, trim set, and fuel balanced per the AFM or POH, as applicable.

b. The aircraft is established on the inbound course and only small changes in heading are required to maintain the correct path and within one dot of course centreline when utilizing instrument guidance.

c. The aircraft is established on glideslope and only small changes in pitch are required to maintain the correct glide path and within one dot of glideslope when utilizing instrument guidance.

d. The descent rate not greater than 1,000 fpm. Approaches that would require a descent rate greater than 1,000 fpm require a special briefing.
e. Indicated airspeed is between $V_{ref}$ and $V_{ref} + 20$, or acceptable ranges specified in the AFM or POH, as applicable.

f. The engine speed is at a setting that allows adequate response when and if a rapid power increase is needed.

The operator should determine specific criteria for when a go-around will be required.

**NOTE:** For more information see:
IG 7.0 Operations in International Airspace

7.1 Operations Outside Sovereign Airspace

The rules in force relating to flight and manoeuvre of aircraft when operating outside the airspace of any sovereign state, i.e. oceanic or high seas, must be in accordance with ICAO Annex 2, Rules of the Air.” The guidance material in this chapter relates primarily to operations in this airspace.

7.2 Compliance

ICAO Contracting States have agreed that the flight rules that apply in international airspace will be those established by ICAO. However, responsibility for enforcement of these rules rests with the State of Registry of the aircraft or State of the Operator. The flight rules are contained in ICAO Annex 2, (Rules of the Air), and procedural aspects are covered in:

- ICAO Procedures for Air Navigation - Air Traffic Management (PANS – ATM), (Doc.4444);
- ICAO Regional Supplementary Procedures, (Doc.7030); and
- individual State Aeronautical Information Publications (AIPs).

Other useful documents are:

- Guidance and Information Material concerning Air Navigation in the North Atlantic Region;
- Oceanic Errors Safety Bulletins at http://www.paris.icao.int;
- FAA Document 91 RVSM Guidance Material on the Approval of Operations/Aircraft for RVSM Operations;
- JAA Document AMJ-20X CNS Annex 2 – Navigation;
- FAA Order 8400.12A;
- FAA Order 8400.33
- JAA Temporary Guidance Leaflet 10
- FAA Advisory Circular 90-96; and

7.5 Standard Operating Procedures

7.5.1 The following sample International Airspace SOP may be modified as required to reflect your operating procedures, and included as a chapter in your COM. If your fleet includes more than one type of aircraft and there are specific procedures for each aircraft type, you may elect to develop an individual International Airspace SOP supplement for each type. In that case you may reference the supplement here and issue each under separate cover.

When operating in international, MNPS, RNAV, RNP or RVSM airspace flight crew shall operate in accordance with the organization’s International Airspace Standard Operating Procedures (International Airspace SOP).
The PIC is to report any anomalies to both the relevant ATS unit and the operator’s management as soon as practicable.

Company crews are to follow the procedures in this SOP. The PIC must check that current copies of the SOP and related documents are on board the aircraft prior to commencing operations in international, MNPS, RNAV, RNP or RVSM airspace.

7.5.2 RVSM

Aircraft intending to operate in RVSM (including D-RVSM) airspace must be approved by the State of Registry or the State of the operator, the operator must have an approved RVSM operations manual and the aircraft must be maintained in accordance with an approved RVSM maintenance program. A verification flight is required as a part of the approval process to operate in any RVSM airspace. Prior to flight into RVSM airspace the PIC must confirm that all of these requirements are met.

The following equipment must be installed and fully operational for flight in radar controlled RVSM airspace:

a. two independent height measuring systems;

b. an automatic altitude control system;

c. an altitude alerter; and

d. one SSR altitude reporting transponder. If only one installed it must be selectable to either air data computer.

To be able to enter North Atlantic and Pacific RVSM non-radar controlled airspace the following equipment must be operating:

a. two independent height measuring systems;

b. an automatic altitude control system; and

c. an altitude alerter.


7.5.3 MNPS, RNAV and RNP Procedures

The flight crew will conduct operations in MNPS, RNAV and RNP airspace, in accordance with the approved regional supplement. The pertinent operating and contingency procedure information must be available to the crew for in flight reference. Documents to be carried and available (depending on the airspace in which the operation is being conducted) are:

a. A guidance manual containing operating and contingency procedures such as the Jeppesen manuals or the North Atlantic MNPS Airspace Operations Manual - Current Edition or other manual appropriate to the airspace within which the operation will be conducted;

b. Approved aircraft Minimum Equipment List incorporating MNPS, RNAV and RNP requirements;

c. An approved document tabulating track and distance between oceanic waypoints (Note: The FMS database is NOT sufficient for this purpose);

d. Appropriate chart and flight guide coverage with regard to the route to be flown;

e. In the NAT MNPS, a copy of the current NAT Track Message;
f. A master copy of the flight plan/log, hereafter referred to as the Master Document; and
g. In the NAT MNPS, a plotting chart of a scale appropriate to the route to be flown.

7.5.4 Route Monitoring and Cross-Check Procedures

The aircraft navigation systems necessary for flying in the MNPS, RNAV and RNP airspace are capable of a high standard of performance. In order to complement these, it is essential to have stringent routines of navigational cross-checking procedures. Adoption of the following procedures will assist in maintaining a high standard of navigation performance, and thus safety, in MNPS, RNAV and RNP airspace.

7.5.5 In-flight Procedures

While on Airways
If the initial part of the flight is conducted along airways, the airways facilities should be used as the primary navigational aids and the aircraft long range navigation systems monitored, to verify that the latter are performing within the prescribed limits.

ATC Oceanic Clearance
Where practical, two flight crew members should listen to and record every ATC clearance. Both should agree that the record is correct. Any doubts should be resolved by requesting clarification from ATC. However, cockpit management should be such that one pilot is designated to be responsible for flying the aircraft, while any amendments to the cockpit documentation and/or reprogramming of the navigation systems are being carried out.

Oceanic Track Changes
If there is a change to the flight planned OTS track or random track, the coordinates of the new track must be plotted on the plotting chart and tracks and distances extracted from the ‘Track and Distance Tables’ and recorded on a revised Master Document. It is these tracks and distances that should be compared with the CDU information and the necessary checks carried out if there are differences greater than 1 NM. Remember to compare like with like, i.e., compare true tracks on the Master Document with true tracks from the CDU; remember, also, the CDU gives initial great circle tracks.

Approaching MNPS/RNAV/RNP Airspace
In the event of significant impairment of navigational capability, the aircraft should not enter the MNPS/RNAV/RNP airspace if it is no longer able to meet the navigational requirements.

Prior to entering the MNPS/RNAV/RNP airspace, the aircraft’s position should be checked as accurately as possible by means of external navigational aids, in order to ascertain the preferred aircraft navigation system to be used thereafter. In the event of a significant discrepancy, the question of whether the affected navigation system should be updated may be given cautious consideration. If it is decided to update the system, the proper procedures should be carried out strictly in accordance with a prepared checklist.

Under no circumstances will the PIC allow the aircraft to enter international airspace unless he is absolutely sure that the clearance has been fully understood, the Flight Plan in the FMS is fully compliant with that clearance and that the required LRN systems are performing accurately.

Crossing each waypoint in-flight
Approaching the waypoint confirm navigation system/FMS position agree with the master document;
a. at the waypoint:
   1. confirm navigation system/FMS switches to next waypoint;
   2. compare the distance to next waypoint on the navigation system/FMS to master document for agreement; and
   3. compare the track on the navigation system/FMS to the magnetic course on the master document for agreement;

b. ten minutes past the waypoint:
   1. record the navigation system/FMS position on the plotting chart; and
   2. plot the position on the plotting chart to determine if the navigation system/FMS is operating on the correct course.

System Monitoring
The importance of constantly monitoring the performance and integrity of the FMS and navigation systems cannot be overstated.

It is important to remember that the auto-pilot may unobtrusively become disconnected from the command mode, therefore regular checks of correct engagement should be made.

Approaching Landfall
When the aircraft is approaching the first landfall navaid, it should acquire the appropriate inbound radial as soon as the flight crew is confident that the landfall navaid is providing reliable navigation information. The aircraft should then be flown using the radio navigation information as a cross check of the long range navigation systems. Where a discrepancy between the aircraft position determined by the LRN systems and the land based nav aids is confirmed, ATC must be informed immediately.

Post Flight Procedures

Navigation System Accuracy Check
At the end of each flight, an evaluation of the accuracy of the aircraft's navigation systems should be carried out, in order to facilitate corrective action for out-of-tolerance performance. Errors in excess of tolerances published in the equipment manual are to be recorded in the Technical Log as a defect. Records should be kept of the aircraft navigation systems performance.

7.5.6 Reduced Vertical Separation Minima (RVSM) Procedures

Flight Planning
a. Verify that the aircraft is approved for RVSM operations;
b. Annotate the flight plan to be filed with the air traffic service provider to show that the aircraft and operator are approved for RVSM operations. When filing an ICAO flight plan insure that item 10 (Equipment) of the ICAO flight plan is annotated with the letter “W” to show RVSM approval;
c. Check reported and forecast weather conditions on the route of flight;
d. Check minimum equipment requirements pertaining to height-keeping systems; and
e. if required for the specific aircraft group, account for any aircraft operating restrictions related to RVSM airworthiness approval.

Pre-flight Procedures at the Aircraft for Each Flight
The following actions should be accomplished during pre-flight:

a. Review maintenance logs and forms to ascertain the condition of equipment required for flight in the RVSM airspace. Ensure that maintenance action has been taken to correct defects to required equipment;

b. During the external inspection of aircraft, particular attention should be paid to the condition of static sources and the condition of the fuselage skin in the vicinity of each static source and any other component that affects altimetry system accuracy (this check may be accomplished by a qualified and authorized person other than the pilot, e.g. a flight engineer or maintenance personnel);

c. Before takeoff, the aircraft altimeters should be set to the local altimeter (QNH) setting and should display a known elevation (e.g., field elevation) within the limits specified in aircraft operating manuals. The difference between the known elevation and the elevation displayed on the altimeters should be within the limits specified in the aircraft flight manual and must not exceed 75 ft. The two primary altimeters should also agree within limits specified by the aircraft-operating manual. An alternative procedure using QFE may also be used; and

d. Before take-off, equipment required for flight in RVSM airspace should be operational, and indications of malfunction should be resolved.

**Procedures prior to RVSM airspace entry**

The following equipment should be operating normally at entry into RVSM airspace:

a. two primary altitude measurement systems;

b. one automatic altitude-control system;

c. one altitude-alerting device; and

d. should any of the required equipment fail prior to the aircraft entering RVSM airspace, the pilot should request a new clearance so as to avoid flight in this airspace.

**NOTE:** In the case of transponder failure, the PIC should ascertain the requirement for an operational transponder in each RVSM area where operations are intended. The PIC should also ascertain the transponder requirements for transition areas adjacent to RVSM airspace.

**In-flight Procedures:**

a. Flight crews should comply with aircraft operating restrictions (if required for the specific aircraft group) related to RVSM airworthiness approval;

b. Emphasis should be placed on promptly setting the sub-scale on all primary and standby altimeters to 29.92 in. Hg/1013.2 (hPa) when passing the transition altitude and rechecking for proper altimeter setting when reaching the initial cleared flight level (CFL);

c. In cruise flight it is essential that the aircraft be flown at the cleared flight level. This requires that particular care be taken to ensure that ATS clearances are fully understood and followed. Except in contingency or emergency situations, the aircraft should not intentionally depart from the cleared flight level without a positive clearance from ATS;

d. During cleared transition between levels, the aircraft should not be allowed to overshoot or undershoot the cleared flight level by more than 150 ft (45 m);

e. An automatic altitude-control system should be operative and engaged during level cruise, except when circumstances such as the need to retrim the aircraft or turbulence require disengagement. In any event, adherence to cruise altitude should be done by reference to one of the two primary altimeters;

f. The altitude-alerting system should be operational;
g. At intervals of approximately one hour, crosschecks between the primary altimeters and the stand-by altimeter should be made. A minimum of two primary altimeters should agree within 200 ft (60 m) or a lesser value if specified in the aircraft-operating manual. Failure to meet this condition will require that the altimetry system be reported as defective and ATC notified. The difference between the primary and stand-by altimeters should be noted for use in contingency situations:

1. the normal pilot scan of cockpit instruments should suffice for altimeter cross-checking on most flights, and
2. at least the initial altimeter crosscheck in the vicinity of the point where Class II navigation has begun should be recorded (e.g., on coast out). The readings of the primary and standby altimeters should be recorded and available for use in contingency situations;
3. normally, the altimetry system being used to control the aircraft should be selected to provide the input to the altitude-reporting transponder that is transmitting information to ATC;
4. if the pilot is notified by ATC of an Actual Aircraft Deviation error which exceeds 300 ft (90 m) then the pilot should take action to return to the cleared flight level as quickly as possible.

Post Flight

In making maintenance log book entries against malfunctions in height-keeping systems, the pilot should provide sufficient detail to enable maintenance to effectively troubleshoot and repair the system. The pilot should detail the actual defect and the crew action taken to try to isolate and rectify the fault. The following information should be noted when appropriate:

a. primary and standby altimeter readings;
b. altitude selector setting;
c. sub-scale setting on altimeter;
d. autopilot used to control the aircraft and any differences when the alternate system as selected;
e. differences in altimeter readings if alternate static ports selected;
f. use of air data computer selector for fault diagnosis procedure; and
g. transponder selected to provide altitude information to ATS and any difference if alternate transponder or altitude source is manually selected.

7.6 International Publications Library

a. Training Course Outline

The following general training program shall be completed prior to (Operator Name) authorization of flight crews to operate in international airspace:
1. ICAO operational rules and regulations;
2. ICAO Units of Measurement standards;
3. Sources and content of international flight publications;
4. Itinerary planning;
5. Preparation of:
   i. ICAO international flight plans; and
   ii. Navigation logs;
6. Route planning within the MNPS/RNP/RVSM airspace where flights are to be conducted;
7. En-route and terminal procedures;
8. Long-range, air-to-ground communications procedures;
9. Structure of the MNPS, RNP, RVSM & RVSM Transition airspace where the flights are to be conducted;
10. Air traffic clearances;
11. International meteorology to include:
   i. Significant weather charts;
   ii. Prognostic weather charts;
12. Tropopause prognostic charts;
13. Terminal weather forecasts (TAF); and
14. Aviation routine weather reports (METAR);
15. Specific en-route navigation procedures for each type of navigation equipment required for use in the special use airspace, including abnormal procedures;
16. Emergency procedures including:
   i. Required emergency equipment;
   ii. Search and rescue techniques;
   iii. Navigation equipment failure techniques;
   iv. Communication equipment failure techniques; and
   v. Specific contingency procedures within MNPS/RNP/RVSM airspace; and
17. Specialized training for operations in areas of magnetic unreliability.

b. Reference Material

The following is a list of documents that may be considered for inclusion in the Aviation library:
1. Convention On International Civil Aviation (Document 7300);
2. ICAO Annex 2 (Rules of the Air);
3. ICAO Annex 5 (Units of Measurement to be Used in Air and Ground Operations);
4. ICAO Annex 6 (Operation of Aircraft);
5. ICAO Annex 11 (Air Traffic Services)
6. ICAO PANS/OPS (Document 8168 Vol. I);
7. ICAO PANS/ATM (Document 4444);
8. ICAO Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Document 9574)
10. Consolidated Guidance Material North Atlantic Region (NAT Doc 001);
12. Guidance and Information Material concerning Air Navigation in the North Atlantic Region;
13. FAA Document 91 RVSM Interim Guidance Material on the Approval of Operations/Aircraft for RVSM Operations; and
14. FAA Order 8400.12A
15. FAA Order 8400.33
16. FAA Advisory Circular 90-96A
18. U.S. Government National Oceanic Service Alaska Chart Supplement; and
Flight crew members should be familiar with their contents and make use of the appropriate documents when planning and conducting operations in international, MNPS, RNP or RVSM airspace.
IG 9.0 Aircraft Maintenance Requirements

9.1 Maintenance Control System

9.1.1 Review the Maintenance Control System

9.1.2 Other Than EASA Operators

a. This section applies only to EASA CAMO certified operations. EASA stipulates oversight responsibility as the owner’s or lessee’s for private operations and the operator’s for commercial operations. A procedure should be implemented to identify the oversight process, such as a periodic audit of the CAMO operations by the operators responsible person.

NOTE: The CAMO oversight process should be integrated into the compliance monitoring system required by IS-BAO 3.3.1.

b. Operators to whom the EASA rules apply must meet the continuing airworthiness requirements of Regulation (EC) No 2042/2003, Annex 1, Part M – Continuing Airworthiness. The requirements of paragraph 9.1 would be fulfilled by:
   a. the operator holding a Regulation (EC) No 2042/2003, Annex 1, Subpart G continuing airworthiness management approval, or
   b. the operator assigning his continuing airworthiness management responsibilities to a continuing airworthiness management organisation, CAMO.

NOTE: For operators falling under EASA rules, the duties of the person responsible for the management of the continuing airworthiness may be fulfilled by the CAMO. However, the ultimate responsibility for aircraft maintenance and airworthiness oversight remains with the owner/lessee/operator."

9.1.3 Is the Maintenance Control System explained in the Company Operations Manual?

9.1.4 Items that are included in the Maintenance Control System

a. Where maintenance functions have been assigned:
   1. The Position or Title of the Person Responsible for Maintenance

   2. The duties and responsibilities of the Person Responsible for Maintenance.

   3. If different from the Operations Manual Organizational Chart, the distribution of functions and lines of authority.

b. For Elementary work or Preventive Maintenance and aircraft servicing:

Note: Elementary work/preventative maintenance, as defined in State of Registry aircraft maintenance regulation, may be performed by pilots at or away from base provided they have received training to conduct the authorized elementary work/preventative maintenance and demonstrated competency at each task to be performed. Those who perform elementary work/preventative maintenance should receive initial and recurrent training in the work to be performed from a qualified aircraft maintenance person or person designated by the AMO to provide such training and have that training recorded in their Training Record.
c. Identification of the State approved Inspection Schedule or Maintenance Program:

Note: It is not intended that the complete inspection schedule or maintenance program be included in the operations manual section that details the maintenance control system. Although an operator may append a maintenance inspection schedule/program to their manual, the maintenance inspection schedule/program must be controlled and updated.

d. Defect Recording and Rectification:
   1. recording aircraft defects;
   2. ensuring that defects are rectified in accordance with regulatory requirements and manufacturer’s specifications;
   3. detecting defects that recur and identifying those defects as recurring defects; and
   4. scheduling, within the permitted period of deferral, the rectification of defects whose repair has been deferred.

Example: Immediately upon finding a discrepancy in an aircraft, or when completing any maintenance on an aircraft, the person discovering the discrepancy or performing the maintenance shall enter details of the event in the applicable aircraft maintenance records required by applicable State regulations. If the discrepancy occurs between scheduled maintenance checks and is discovered by a flight crew member, an entry shall be made in the Aircraft Flight Log. When a discrepancy is discovered prior to a flight, by a flight crew member or a technician, the discrepancy shall also be entered in the Aircraft Flight Log. The Maintenance Manager or designee shall ensure that aircraft maintenance entries have been entered in the applicable airframe, engine, and/or component maintenance records prior to return to service of the airframe, engine, and/or component. Details of defects found during a scheduled inspection and/or routine maintenance shall be entered in the monthly Aircraft Work Order, and a condensed detailed summary shall be entered in the applicable airframe, engine, and/or component permanent maintenance record. Deferral of a maintenance event must be found to be allowable in accordance with the applicable MEL/NEF before the aircraft may be approved for return to service. Prior to flight and prior to the return to service following the inspection and/or maintenance event those outstanding items shall be entered in the MEL Deferred Item List and Aircraft Flight Log.

e. A description of the assessment program for Airworthiness Directives (AD) and Service Bulletins (SB). Note: A form that may be used for this purpose is attached as Attachment A.

Example: The Person Responsible for Maintenance shall review all new and revised Airworthiness Directives and Service Bulletins upon receipt, to determine if they are applicable. He/she shall enter details of all applicable airworthiness directives and Service Bulletins pertaining to the aircraft make and model, in the appropriate airframe, engine, propeller or component technical record. He/she shall determine the date, air time or operating cycles, when the actions specified in the directive must be taken. If the required actions are due before the next scheduled maintenance activity he or she shall make the necessary entries in the aircraft log.

f. Procedures for using only approved parts and materials: Note: This is intended to include any stores procedures that may be used by the operator, including those procedures used for the control of petroleum, oil and other lubricants, as required by State regulation.

Example: Spare parts and materials will be procured from original equipment manufacturers,
authorized distributors and other approved sources. Fuels, oils, lubricants and cleaning materials shall be kept in closed containers, clearly marked with the contents, date opened and handle in accordance with applicable industry recommendations. No fluids shall be dispensed from any unmarked container. Suspected Un-approved Parts will be quarantined and inspected further by the Person Responsible for Maintenance. Shelf life item control is also in place to preclude the issue of a unit that has exceeded a scheduled maintenance interval or a consumable part has expired while in storage.

g. Procedures for Calibrated Tooling used in maintenance:
Example: The Person Responsible for Maintenance is responsible to ensure maintenance personnel are trained in the proper use and care of precision tools, measuring devices, and test equipment. Technicians are responsible for inspecting calibrated tools or equipment for currency and serviceability before each use. They are also responsible for immediately removing from service, quarantining and reporting any equipment found to be out of calibration or damaged.

h. A description of the maintenance training and required competencies of the maintenance staff. The training programme must ensure that personnel trained are familiar with the regulations, standards and operator procedures associated with certain work. The training programme should include:
1. initial training to ensure that persons authorised to perform or request the performance of maintenance, elementary work/preventative maintenance or servicing are aware of the regulations, standards and operator procedures associated with that work.
2. initial aircraft type training for aircraft maintenance personnel involved in the performance of maintenance.
3. recurrent training and evaluation to affirm that personnel remain competent in the performance of their duties and are aware of changes to related regulations, standards and operator procedures.

Example: The Maintenance Manager shall ensure that all employees receive initial and update training on maintenance procedures, preventative maintenance, servicing tasks and State Regulations appropriate to their duties. Any person authorized to sign a return to service or maintenance release will receive initial, recurrent, systems, or related training, appropriate to the aircraft group, type or system for which a release is to be signed. The training program shall be conducted so as to ensure that the person acquires the competence to perform their assigned duties. Recurrent training will be carried out on an annual basis alternating each year between the aircraft types being operated. Details of the training undertaken by each employee shall be recorded on the individual's training record;

i. a description of the kinds of personnel and training records kept;

j. a description of the procedure used to ensure that the empty weight and balance of an aircraft is recorded in accordance with the regulatory requirements and related operational data is amended;

k. the identification of any person eligible to apply for a Special Flight Permit or Special Flight Authorization in respect of the operators aircraft;

l. Procedures for a tool control program designed to ensure tools and test equipment are accounted for following maintenance. Positive tool control processes can reduce aircraft accidents and incidents. Tools and maintenance materials left inside or on aircraft can also result in foreign object damage (FOD). To reduce the potential for incidents, accidents and
damage related to leaving such items in or on the aircraft, a dedicated process should provide for the inspection and or accountability of all tools and maintenance materials prior to releasing the aircraft from maintenance.

The process should be documented or accounted for within maintenance forms and checklist, such as final inspection checklist or pre-closing inspections of sealed areas and maintenance access areas. The tool control program (TCP) may provide a means of rapidly accounting for all tools after completing a maintenance task on an aircraft or its related equipment with a tool inventory process. For elementary or line maintenance organizations it may be facilitated by a documented pre-inspection requirement of areas where maintenance was performed which is not obvious to the operating crew. This inspection may be conducted by any assigned personnel, providing there are no regulatory inspection requirements to be met.

Consider these items before implementing a TCP.
1. How extensive will the program be?
2. What materials will be monitored?
3. Who can perform a general inspection of the area?
4. What forms if any should be required?
5. Will all the tools be in the TCP?
These issues must be clearly stated in the TCP and referred to by checklist when a checklist is used for confirmation. Once you have committed to a Tool and Material Control Program, it must be in writing. Additionally, it should be added to the internal audit program.

m. The Operations Manual shall list a fatigue management program for all maintenance personnel even if there is only one person. See also Section 6.13.

n. Procedures to manage the risks associated with maintenance personnel working alone. It is recommended these procedures include a risk assessment.

9.1.5 An operator must provide a copy of the operations manual section that details the maintenance control system, or relevant portions thereof, to each person who performs or certifies work. In the case where only a portion of the manual is provided, it must be sufficiently comprehensive that the person performing the tasks has all relevant information. For non-scheduled work, temporary copies of the relevant portions of the operations manual section that details the maintenance control system, or any incorporated reference, may be sent via facsimile transmission.

9.1.6 An operator shall include in the part of its operations manual that describes its maintenance control system defect recording and rectification control procedures for:

a. recording aircraft defects as they are encountered and documented in the flight or journey log;

b. ensuring that defects are rectified in accordance with regulatory requirements and manufacturer’s specifications in a timely manner or deferred through the minimum Equipment List (MEL)

c. detecting defects that recur and identifying those defects as recurring defects and include a method to highlight defects that recur so that they are readily identifiable by flight crews and by the maintenance personnel at all bases where the aircraft is operated. An operator is responsible for identifying recurring defects, as such, to maintenance personnel in order to avoid the duplication of unsuccessful attempts at rectification.
d. scheduling, within the permitted period of deferral, the rectification of defects whose repair has been deferred, but in no case later than the times identified in the State of Registry regulatory requirements, including any repair time category intervals established in the operator’s MEL.

9.1.7 An operator should include in the part of its operations manual that describes its maintenance control system technical dispatch instructions that:

a. ensure that aircraft are:
   i. in a condition for safe operation, airworthy,
   ii. appropriately equipped, configured and maintained for the intended use, and
   iii. maintained in accordance with the approved/accepted maintenance program;

b. ensure that all MEL procedures are followed and requirements are met; and Where an approved MEL is in use, the technical instructions shall make reference to the MEL procedures and defect control system. Where no approved MEL is in use, the operator shall include procedures and instructions to ensure that the flight crew and/or authorized certifying staff can assess effective aircraft equipment against regulatory requirements. These may be directed to other personnel involved in dispatch of the aircraft, provided the duties and responsibilities of those persons are described in the section of the operations manual.

c. meet the requirements of the State of Registry civil aviation regulations and standards; and

d. ensure that a maintenance release is completed and signed, as prescribed by the State of Registry, to certify that the maintenance work has been performed in accordance with the maintenance programme or other data and procedures acceptable to the State of Registry.

e. Where an operator deploys an aircraft to a remote location that is outside of its main area of operation, the operator must ensure that the technical dispatch instructions remain effective

**Note:** The purpose of the technical dispatch instructions is to form the basis upon which the pilot-in-command will determine aircraft serviceability in respect of airworthiness directives, maintenance, and operational or operator requirements.

9.1.8 An operator may deviate from the procedures required by its maintenance control system where the deviation conforms to national regulations and is substantiated by a risk analysis.

9.1.9 The owner or operator of an aircraft, or in the case where it is leased, the lessee, shall ensure that the following records are kept for the periods mentioned below:

a. the total time in service (hours, calendar time and cycles, as appropriate) of the aircraft and all life limited components;

   • the current status of compliance with all applicable mandatory continuing airworthiness information, including life limited components;

   • appropriate details of modifications and repairs to the aircraft;

   • the time in service (hours, calendar time and cycles, as appropriate) since the last overhaul of the aircraft or its components subject to a mandatory overhaul life;

   • the current status of the aircraft’s compliance with the maintenance programme; and

   • the detailed maintenance records to show that all requirements for the signing of a maintenance release have been met.

The records in 9.1.9.a. to 9.1.9.e., shall be kept for a minimum period of 90 days after the unit to which they refer has been permanently withdrawn from service and the records in 9.1.9.f. for a minimum period of one year after the signing of the maintenance release.
Note: State of Registry requirements for record retention may vary and must be respected.

9.1.10 An operator’s maintenance control system should include procedures to ensure that safety of flight defects detected during aircraft operation or during the performance of maintenance, elementary work/preventative maintenance or servicing are recorded. Some States have a Service Difficulty Reporting (SDR) system that enables an operator to submit reports of aircraft components or parts that do not meet their intended life or function.

9.1.11 An operator of turbojet-engined aeroplanes OR those with a maximum takeoff mass exceeding 5,700 kg, OR any aircraft engaged in commercial air transport OR aerial work, shall ensure the maintenance programme, acceptable to the State of Registry,:
   a. observe Human Factors principles according to the State of Registry’s guidance material;
   b. includes if applicable, a continuing structural integrity programme;
   c. includes when applicable and approved by the State of Registry, condition monitoring and reliability programme descriptions for aircraft systems, components and powerplants.

Maintenance tasks and intervals that have been specified as mandatory in approval of the type design, or approved changes to the maintenance programme, shall be identified as such.

9.2. Maintenance Agreements

9.2.1 No operator should permit a person to perform maintenance on an aircraft unless the person is an employee of the operator or has been authorized to perform the work under the terms of a written maintenance agreement. Every maintenance agreement should specify the maintenance required and clearly define the tasks to be performed and the conditions under which they must be performed. The operator is responsible for defining the tasks to be performed by any external agent and for ensuring the completion of those tasks.

9.2.2 The operator’s maintenance control system should contain provisions for the performance of defect rectification or maintenance when it is necessary to do so at locations where the operator does not have prearranged maintenance agreements. These provisions should include guidance to flight crewmembers to ensure that the work is done by competent organizations.

Note: For prearranged agreements, the general concept of maintenance to be performed is known at time of agreement, but the exact tasks are often only forecast. The agreement should identify how the specific requirements will be communicated each time the agreement is activated.

For ad hoc agreements, the total requirement and task list is typically available. The operator needs a method of compliance that provides in writing what is needed to meet the standard, and is practical to use. Some proforma document carried by flight crew and/or faxed by dispatch is a typical method.

9.3 Person Responsible for Maintenance

9.3.1 An operator’s maintenance control system shall be described in the company operations manual or maintenance manual and will:
   a. identify the person responsible for the maintenance control system; and
   b. authorize the person who is responsible for its maintenance control system to remove aircraft from operation, where the removal is justified because of non-compliance with regulatory requirements or because of a risk to the safety of the aircraft, persons or property.
c. specify the means under which the maintenance is performed and the processes used to control the airworthiness of the company aircraft.

d. All aircraft maintenance operations must be accomplished per the respective manufacturer’s technical documents or other acceptable data. If no technical publications exist, a written non-conformance (discrepancy) will be submitted to the manufacturer requesting disposition for corrective action.

Note: Where the operator is the holder of an Approved Maintenance Organization (AMO) certificate that is appropriate to the aircraft being operated, the person responsible for the maintenance control system should be the person responsible for the maintenance control system of the AMO.

9.3.2 The operator shall provide the person who is responsible for its maintenance control system with the staff, facilities and other resources necessary to ensure that the maintenance is conducted in accordance with regulatory requirements and meets the safety management goals of the operator. The person who is responsible for a maintenance control system may assign to another person management functions for specific maintenance control activities if the assignment and the assigned functions:

a. are described in writing in the part of the operations manual or maintenance manual, that describes the maintenance control system; and

b. the function should be pertinent to those duties required to ensure compliance with regulatory requirements and need not address duties related to other operator administrative functions and

c. the identity of the person to whom they report and

d. conform with State regulatory requirements and

e. a description of the function being assigned.

f. facilities for the management of the maintenance activities that include but are not limited to:

1. a place of business, with a fixed address;

2. communications and maintenance hangar facilities;

3. devices which establish when a particular aircraft requires maintenance. Examples are planning bulletin boards, card files, or a computer system that meets the standards applicable to computer devices used for planning purposes;

4. where the operator performs elementary work/preventative maintenance or servicing, the equipment and tools necessary to do this work; and

5. a secure, dry storage area to retain aircraft records.
Attachment A - Service Bulletin & A. D. Review Form

(Operator Name)

S.B. or A.D. Title ________________________________ No. __________________

Priority:
Mandatory □ Recommended □ Completion Required by __/__/__ or ____ Flt. Hrs.
Optional □

For Aircraft: _______________. S/N__________________ Applicable □ N/A □

Man Hours Req. -_____ Down Time Req._____ In-house Capable Yes □ No □

Date of Receipt __/__/__ Review Completed __/__/__ Location ____________

Review Participants & Recommendation:

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Decision Rationale -

_____________________________________________________________________________________________________

Final Authorization

Accepted □ Schedule for accomplishment: By date - __/__/__ or within ______Flt. Hrs.

Or, At next _____ Inspection / shop visit.

Declined / Rejected □ - because______________________________________________________________

_____________________________________________________________________________________

Signed by: Department Manager or Director of Maintenance ________________________________

S/B-AD Review Form

#2013 – Rev. Date __/__/__
IG 10.0 Company Operations Manual

A company operations manual, which may be issued in separate parts corresponding to specific aspects of an operation, should include the instructions and information necessary to enable the personnel concerned to perform their duties safely. Company operations manuals will vary in detail and complexity in accordance with the complexity of the operation and of the type and number of aircraft operated. An operator with several turbine powered aircraft will have a more comprehensive operations manual than will be required by an owner operated single small aircraft operator. Operators who hold an air operator certificate must meet the requirements specified by their civil aviation authority.

The company operations manual should be such that:

a. all parts of the manual are consistent and compatible in form and content;

b. the manual can be readily amended through an amendment process with distribution of the manual to users listed;

c. the manual contains an amendment control page and a list of the pages that are in effect; and

d. the manual has the date of the last amendment of each page specified on that page.

Two versions of generic company operations manuals (GCOMs) are available for aeroplane operators to use as a basis for development of their company operations manual. One is the regular version and the other is in the format as prescribed by EU OPS. The generic manuals provide a template; however, the content of the manual will vary among operators based on the size, scope, complexity of operations and the operator’s risk profile and mitigation.

The operator should provide a copy of the appropriate parts of its operations manual, including any amendments to that manual, to each of its crew members and to its ground operations and maintenance personnel.

The operator may place a copy of the appropriate parts of its operations manual in each aircraft that it operates, instead of providing a copy to each crew member. Every person who has been provided with a copy of an operations manual must keep it up to date with the amendments provided and shall ensure that the appropriate parts are accessible when the person is performing assigned duties.
Helicopter Company Operations Manual

The following recommended content of an operations manual is an extract from ICAO Annex 6 Part III. Operators may use it as guidance; however, holders of air operator certificates must meet the requirements specified by their civil aviation authority.

2.1 General

2.1.1 Instructions outlining the responsibilities of operations personnel pertaining to the conduct of flight operations.

2.1.2 Rules limiting the flight time and flight duty periods and providing for adequate rest periods for flight crew members and cabin crew.

2.1.3 A list of the navigation equipment to be carried, including any requirements relating to operations where performance-based navigation is prescribed.

2.1.4 The circumstances in which a radio listening watch is to be maintained.

2.1.5 The method for determining minimum flight altitudes.

2.1.6 The methods for determining heliport operating minima.

2.1.7 Safety precautions during refuelling with passengers on board.

2.1.8 Ground handling arrangements and procedures.

2.1.9 Procedures, as prescribed in Annex 12, for pilots-in-command observing an accident.

2.1.10 The flight crew for each type of operation including the designation of the succession of command.

2.1.11 Specific instructions for the computation of the quantities of fuel and oil to be carried, having regard to all circumstances of the operation including the possibility of loss of pressurization and the failure of one or more engines while en route.

2.1.12 The conditions under which oxygen shall be used and the amount of oxygen determined in accordance with Section II, Chapter 2, 2.3.8.2.

2.1.13 Instructions for mass and balance control.

2.1.14 Instructions for the conduct and control of ground de-icing/anti-icing operations.

2.1.15 The specifications for the operational flight plan.

2.1.16 Standard operating procedures (SOP) for each phase of flight.

2.1.17 Instructions on the use of normal checklists and the timing of their use.

2.1.18 Departure contingency procedures.

2.1.19 Instructions on the maintenance of altitude awareness.
2.1.20 Instructions on the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved.

2.1.21 Departure and approach briefings.

2.1.22 Route and destination familiarization.

2.1.23 Conditions required to commence or to continue an instrument approach.

2.1.24 Instructions for the conduct of precision and non-precision instrument approach procedures.

2.1.25 Allocation of flight crew duties and procedures for the management of crew workload during night and IMC instrument approach and landing operations.

2.1.26 Information and instructions relating to the interception of civil aircraft including:
   a) procedures, as prescribed in Annex 2, for pilots-in-command of intercepted aircraft; and
   b) visual signals for use by intercepting and intercepted aircraft, as contained in Annex 2.

2.1.27 Details of the safety management system (SMS) provided in accordance with Section II, Chapter 1, 1.3.3.

2.1.28 Information and instructions on the carriage of dangerous goods, including action to be taken in the event of an emergency.

NOTE: Guidance material on the development of policies and procedures for dealing with dangerous goods incidents on board aircraft is contained in Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods (Doc 9481) in the IS-BAO Tool Kit.

2.1.29 Security instructions and guidance.

2.1.30 The search procedure checklist provided in accordance with Section II, Chapter 11, 11.1.

2.1.31 Instructions and training requirements for the use of head-up displays (HUD) or enhanced vision systems (EVS) equipment as applicable.

2.2 Aircraft Operating Information

2.2.1 Certification limitations and operating limitations.

2.2.2 The normal, abnormal and emergency procedures to be used by the flight crew and the checklists relating thereto as required by Section II, Chapter 4, 4.1.4.

2.2.3 Flight planning data for pre-flight and in-flight planning with different thrust/power and speed settings.

2.2.4 Instructions and data for mass and balance calculations.

2.2.5 Instructions for aircraft loading and securing of load.

2.2.6 Aircraft systems, associated controls and instructions for their use, as required by Section II, Chapter 4, 4.1.4.
2.2.7 The minimum equipment list for the helicopter types operated and specific operations authorized, including any requirements relating to operations where performance-based navigation is prescribed.

2.2.8 Checklist of emergency and safety equipment and instructions for its use.

2.2.9 Emergency evacuation procedures, including type-specific procedures, crew coordination, assignment of crew’s emergency positions and the emergency duties assigned to each crew member.

2.2.10 The normal, abnormal and emergency procedures to be used by the cabin crew, the checklists relating thereto and aircraft systems information as required, including a statement related to the necessary procedures for the coordination between flight and cabin crew.

2.2.11 Survival and emergency equipment for different routes and the necessary procedures to verify its normal functioning before take-off, including procedures to determine the required amount of oxygen and the quantity available.

2.2.12 The ground-air visual signal code for use by survivors, as contained in Annex 12.

2.3 Routes, Aerodromes and Heliports

2.3.1 A route guide to ensure that the flight crew will have, for each flight, information relating to communication facilities, navigation aids, aerodromes, instrument approaches, instrument arrivals and instrument departures as applicable for the operation, and such other information as the operator may deem necessary for the proper conduct of flight operations.

2.3.2 The minimum flight altitudes for each route to be flown.

2.3.3 Heliport operating minima for each of the heliports that are likely to be used as heliports of intended landing or as alternate heliports.

2.3.4 The increase of heliport operating minima in case of degradation of approach or heliport facilities.

2.3.5 Instructions for the use of aerodrome operating minima for instrument approaches applicable to the use of HUD and EVS.

2.4 Training

2.4.1 Details of the flight crew training programme and requirements, as required by Section II, Chapter 7.7.3.

2.4.2 Details of the cabin crew duties training programme as required by Section II, Chapter 10.3.

2.4.3 Details of the flight operations officer/flight dispatcher training programme when employed in conjunction with a method of flight supervision in accordance with Section II, Chapter 2, 2.2.

NOTE: Details of the flight operations officer/flight dispatcher training programme are contained in Section II, Chapter 8, 8.3.
15.1. Overview

A security programme shall be maintained that is proportional to the threat against the operator, its personnel, aircraft and facilities. The security programme should include a threat assessment process, preventive measures designed to deter and prevent the commission of unlawful acts, responsive measures to be taken when an unlawful act has been committed against the operator, and appropriate training and testing of personnel involved.

15.2. Assessing the Threat and Vulnerability

The first step in the development of an effective security programme is to assess the threat against the operator, its personnel, aircraft and facilities and the operator’s vulnerabilities. Threats may relate to the nature of business the organization conducts, where that business is conducted, the nationality of the organization, the nationality of operator aircraft, the profile of passengers carried, and the value of goods carried. Information on the various kinds of threats the operator is subject to will come from a variety of sources. In developing and maintaining a current threat assessment for areas of operations, the manager should use the following resources as appropriate:

- national and local security officials;
- national and local law enforcement officials;
- the organization’s security officer, if applicable;
- national and international trade associations;
- air security assessment and intelligence service providers;
- local and foreign media reports; and
- organization officials posted in foreign locations, if applicable.

Security professionals can provide assistance in determining and assessing the operator’s vulnerabilities.

15.3. Preventive Measures

The focus of preventive security measures will be to:

- prevent unauthorized access to operator aircraft and facilities;
- prevent the unauthorized introduction of weapons or explosives onto company aircraft and into the operator’s facilities; and
- prevent the use of operator aircraft to commit unlawful acts, such as the transport of illicit drugs.

The security measures implemented by the operator should be proportional to the threat. Procedures and training should be in place to implement enhanced measures when the threat is increased and to implement reduced measures when the threat is reduced.

Preventive security measures will include, as appropriate:

- Global Considerations
  - Whenever possible avoid areas where there is an identified security risk;
  - Have a security program that is specific to your location and operation;
  - Ensure that all operator personnel receive security program training;
iv. Make security an integral part of all aspects of the organization and its operation;

v. Establish a Security Champion role, much like the Safety manager role;

vi. Maintain a security information program; and


b. People and Processes
   i. Require pre-employment screening of operator personnel;
   ii. Require that crew members display photo IDs at all times;
   iii. Limit the publication of aircraft itineraries;
   iv. Establish security threat alerting procedures, such as a code word for use by persons under duress;
   v. Require an accurate and accessible passenger manifest for all trip legs;
   vi. Ensure that only operator personnel and authorized guests, identified in advance, are allowed to board the operator’s aircraft;
   vii. Ensure that passengers or operator personnel maintain positive control of luggage; and
   viii. Positively identify all luggage and match luggage to specific passengers (colour-coded bag tags can be helpful).

c. Aircraft
   i. Check lavatories, baggage compartments and all cavities for unauthorized people or objects prior to every departure;
   ii. Ensure that an operator staff member is present at all times when the aircraft is being serviced (fuelling, catering, etc.) at operator facilities;
   iii. Ensure that an aircraft crewmember is present at all times when the aircraft is being serviced (fuelling, catering, etc.) at locations away from the operator’s aviation facility;
   iv. Use the aircraft's security system (locks and alarms) whenever it is unattended away from the operator’s facilities;
   v. Apply tamper evidence security tape on door, panels, etc.;
   vi. Post a guard at the aircraft when away from the operator’s facilities at locations where security is a concern; and

vii. Consider removing the organization’s identification from the aircraft and facilities.

d. Facilities
   i. Ensure operator facility perimeter security with effective fencing, lighting, security patrols (as appropriate), gates and limited access areas;
   ii. Ensure external gates and doors are closed and locked at all times;
   iii. Require positive access control for all external gates and doors;
   iv. Close hangar doors when that area is unattended;
   v. Secure all key storage areas (food and liquor, parts and tools, etc.);
   vi. Have an access control management system for keys and passes;
   vii. Confirm the identity and authority of each passenger, vendor and visitor prior to allowing access to facilities and aircraft;
   viii. Accompany all visitors away from secure areas (visitor lounge, etc.);
   ix. Require a picture ID of any unfamiliar or unaccompanied visitor or vendor;
   x. Post emergency numbers prominently around facility;
   xi. Ensure easy access to phones or "panic buttons" in various facility locations (break room, hangar bay, etc.); and
xiv. Confirm security of destination facilities.

15.4. **Responsive Measures**

In the case of a hijacking, the flight crew must attempt to make an assessment of the intent of the hijacker and follow the emergency procedures set out in the company operations manual. These procedures will include the making of distress radio calls and transponder settings, to indicate that the aircraft has been hijacked and for adherence to the procedures that have been established and promulgated in ICAO Doc 7030 – *Regional Supplementary Procedures* in both the cases where the aircraft continues on the assigned track and cruising level or is forced to deviate there from.

In the case of bomb threats, the operator should first determine the legitimacy of the threat or whether it is likely to be a hoax. If considered to be legitimate, law enforcement officials should be notified. If the aircraft is in the air, ATS should be notified and the aircraft should land to be searched. If on the ground, the aircraft should be moved, for searching, to the designated isolated parking.

In the case of other unlawful acts, the operator should contact the responsible law enforcement agencies.

15.5. **Training and Testing**

The security training program should include initial and periodic recurrent training in:

a. The operator’s procedures for:
   i. Assessment of threats and vulnerabilities,
   ii. Preventative measures,
   iii. Responsive measures.

b. Related State security requirements.

**Additional Guidance:**

See the GCOM for additional guidance for developing security checklists.

The NBAA also offers up-to-date guidance at [http://www.nbaa.org/ops/security/](http://www.nbaa.org/ops/security/)
Guidance for Single Pilot Operations

Introduction

This Supplement to the IS-BAO – an International Standard for Business Aircraft Operations has been developed to provide guidance to business aircraft operators whose operation will involve single pilot operations of very light jets (VLJs) and technically advanced aircraft (TAAs) and single pilot helicopters. For the purpose of this Supplement, very light jets are jet aircraft weighing 10,000 pounds or less (a distinction from the traditional definition of large aircraft as more than 12,500 pounds, and light aircraft as 12,500 pounds or less) and are certificated for single pilot operations.

The Supplement provides material to assist such operators to meet the various standards specified in the IS-BAO (which may be referred to as ‘the Standard’) and to become IS-BAO Registered. It should be used in conjunction with the generic single pilot operations manual (GSPOM) or the Helicopter Association International (HAI) helicopter mission specific standards. The NBAA Light Business Aircraft Operations Manual template at http://www.nbaa.org/admin/policies/lba-flight-ops-manual/ may also be appropriate for some operators.

IS-BAO Standards

3.0 Safety Management Systems

A safety management system (SMS) is the process by which an operator identifies the hazards and associated risks that are inherent in the individual operation, assesses them and develops appropriate mitigation to eliminate the hazards or reduce the associated risk to an acceptable level. The mitigations are then implemented and tracked to ensure that they are appropriate and effective. The risk assessment should take into consideration all aspects of the operation and should be integrated into the programs, systems, and procedures that the operator develops to meet the IS-BAO standards.

The SMS requirements in the IS-BAO reflect the ICAO SMS Framework which has been designed to be applicable to all aircraft operators plus a broad range of other aviation activities. As such, it has inherent flexibility and can be adapted for single pilot operations. Simply, it is a tool to assist the operators carry out their responsibility for the safety of their operation. A number of operators of single pilot high performance aircraft have used the IS-BAO SMS model and reported that they have found it an effective way to manage the safety of their operation.

In using this model the key is that the operator must ensure that safety management activities are appropriate to the operation. If the pilot is the owner and the only person involved, the SMS will be less complex than the situation where there is more than one pilot involved, but it will still address all of the elements identified in the standard. In this case the safety policy and accountabilities will be principles that the owner/pilots developed on their own, with family and colleagues or with the assistance of additional expertise, through careful thought in the absence of other external pressures. These should then be used to establish safety goals for the operation. Examples are contained in the GSPOM.

The IS-BAO SMS standard calls for the operators to have procedures for involving employees in the establishment and maintenance of their SMS and related procedures. In the case of an owner/pilot where there are no other employees, the involvement of persons such as the aircraft maintenance contractor/person, should be provided for.
For guidance material on the conduct of risk analysis, the collection and analysis of data and the development of risk mitigation activities, please see the SMS Toolkit. In doing a risk analysis those involved in single pilot operations should pay particular attention to the hazards and associated risks inherent in that type of operation. For example, there are a number of risks associated with the hazards of a missed approach during marginal weather at night in a high density traffic area or VFR helicopter operations.

The next step in the process is to develop and implement appropriate mitigation to either eliminate the hazard or reduce the level of risk to an acceptable level. While training is an obvious mitigation process, mitigation may include the use of proven tools such as a Personal Minimums Checklist, the Flight Safety Foundation CFIT Checklist and single pilot resource management (SRM) or threat and error management (TEM) principles. These are all important in single pilot operations because they promote thinking ahead and planning for critical situations where there may be intense pressure and quick action is required. Information on Personal Minimums Checklist can be found at [http://www.faa.gov/training_testing/training/fits/guidance/media/personal%20minimums%20checklist.pdf](http://www.faa.gov/training_testing/training/fits/guidance/media/personal%20minimums%20checklist.pdf). SRM is discussed in the FAA/Industry Training Standards (FITS) at [http://www.faa.gov/training_testing/training/fits/](http://www.faa.gov/training_testing/training/fits/) and information on the Flight Safety Foundation CFIT Checklist is at [http://flightsafety.org/current-safety-initiatives/controlled-flight-into-terrain-cfit/cfit-reduction-products](http://flightsafety.org/current-safety-initiatives/controlled-flight-into-terrain-cfit/cfit-reduction-products) and [http://flightsafety.org/files/cfit_check.pdf](http://flightsafety.org/files/cfit_check.pdf).

Once the mitigation is developed and implemented it should be tracked to ensure it is appropriate and effective. The tracking system should also be used to identify emerging hazards and risks. In a single pilot operation this system need not be complex. However, it should include a process for recording of issues and events so that the owner/pilot can periodically review the results of safety management efforts and assess emerging risk.

### 4.0 Organization and Personnel Requirements

The important consideration with the Organization and Personnel standards for small operations is that one person will be responsible for the duties of the flight department manager, chief pilot and person responsible for maintenance. This situation is already provided for in section 4.1.1 of the standard. The GSPOM has a model for meeting this standard and the HAI helicopter mission specific standards can be helpful.

### 5.0 Training and Proficiency

Two very good sources of material that may be used for meeting the requirements of the Training and Proficiency standards are the FAA/Industry Training Standards (FITS) at [http://www.faa.gov/training_testing/training/fits/](http://www.faa.gov/training_testing/training/fits/) and the NBAA Training Guidelines – Single Pilot Operations of Very Light Jets and Technically Advanced Aircraft at [http://web.nbaa.org/public/ops/safety/vlj](http://web.nbaa.org/public/ops/safety/vlj). While these were developed primarily for the new generation very light jets (VLJs) the philosophy is adaptable for legacy aircraft. As was previously noted, training is often cited as appropriate mitigation for identified safety-risks. In such cases that training should be included in the training section of the GSPOM or training manual.

Standard 5.2 recommends Crew Resource Management training for pilots, dispatchers and maintenance personnel. In the case of single pilot high performance operations, the cockpit resource management/single pilot resource management training that is discussed in the NBAA Training Guidelines – Single Pilot Operations of Very Light Jets and Technically Advanced Aircraft and the single pilot resource management (SRM) training that is discussed in the FAA/Industry Training Standards are two recommended resources. FAA Advisory Circular 120-51E, Crew Resource Management and UK CAA CAP 737 Crew Resource Management Training, may also be helpful.
While State civil aviation licensing regulations may not require a type rating and PPC for some high performance aircraft, it must be understood that for IS-BAO registration pilot proficiency must be certified at the conclusion of initial training and every 24 calendar months thereafter.

6.0 Flight Operations

While standard 6.1 requires the operator to have standard operating procedures (SOPs) for two crew aircraft, it is recommended that an SOP also be developed and used for single pilot operations. Guidance material on SOPs in general is available at http://web.nbaa.org/public/ops/safety/manual and guidance material specifically for single pilot operations can be found at http://www.tc.gc.ca/eng/civilaviation/standards/commerce-manuals-singlecrewsop-menu-1321.htm as well as the HAI helicopter mission specific standards.

Standard 6.13 Flight and Duty Time needs careful attention for single pilot operations, especially in owner/pilot operations where the aircraft is used as a business tool. In such cases the operator’s fatigue management system should take into account the time spent on other duties (office work, meetings, etc.), as well as flight duties. Fatigue management is also an appropriate application for a personnel minimums checklist. The GSPOM contains a suggested model (one way but not the only way) for meeting the requirements of the standards contained in this chapter. An interesting fatigue training module is available at http://ipp.nasa.gov/innovation/innovation104/5-aerotech1.html

7.0 Operations in International, RVSM, MNPS or RNP Airspace

While most single pilot operations will not be conducted in international airspace, some will be conducted in RVSM airspace. RVSM, MNPS and RNP operations are also addressed in standard 6.6.

8.0 Aircraft Equipment

No special considerations have been noted in the chapter.

9.0 Aircraft Maintenance Requirements

In many single pilot operations the owner/pilot will be the person responsible for maintenance. The requirements of this chapter and the guidance material in GM 9.1 Maintenance Control System and 9.3 Operator Maintenance Evaluation Programme are very important in the owner/pilot situation where maintenance is done under contract. While the maintenance contractor may be capable of carrying out all of the maintenance activities, the responsibility still rests with the aircraft owner and special attention should be paid to this chapter.

10.0 Company Operations Manual

A generic single pilot operations manual (GSPOM) has been developed to assist operators develop their company operations manual. Operators using the GSPOM to develop their operations manual must ensure that the end product is appropriate to their individual operation.

11.0 Emergency Response Plan

A key consideration for owner/pilots when developing their Emergency Response Plan is that if there is a major accident, it may mean that the owner of the company has been lost. Such potential requires careful consideration.
12.0 Environmental Management

No special considerations have been noted in the chapter.

13.0 Occupational Health and Safety

In many single pilot operations this chapter will not be applicable. Operators should review the Occupational Health and Safety standard and make a determination.

14.0 Transportation of Dangerous Goods

In most instances dangerous goods will not be transported, so the main consideration will be to ensure that they are not inadvertently carried on the aircraft. This issue is addressed in the para 14.2.

15.0 Security

No additional considerations have been noted in the chapter.