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](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](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 chapter of the IS-BAO. 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 (GM) is presented 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 GM 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.
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 website 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 GM 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 Guidance Material

The IS-BAO also contains extensive guidance material. GMs are provided for a number of the standards. They are guidance provided as one means, but not the only means, of meeting the standards. The GMs are cross referenced to the applicable standard. For example, the standard for safety management systems is contained in section 3.2. GM 3.2 then presents guidance material for the development of the operator’s safety management system. Additionally, GM 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 GM 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 website 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 chooses 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 1630 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 choose 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 HAI. 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*: GM 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 is 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 Freedom of Choice

*Note*: Operators that have implemented the IS-BAO’s code of practice have demonstrated a high level of corporate accountability in promoting highly professional safety standards.
However, even this high standard should not remove an individual’s right to choice. Therefore, organizations may wish to consider a Human Resource policy that provides employees with a choice regarding the requirement to fly as passengers with any given private or any commercial aircraft.
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: GM 4.1 contains a recommended organization structure and the associated duties and responsibilities for management personnel. The GM also includes responsibilities and qualifications for a safety officer. A safety officer may be required in larger flight operations to assist the manager in exercising his/her accountabilities for the safety of the operations and management of the SMS.

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, 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

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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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”.

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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 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 GM 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 GM 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.
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 GM 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 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 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 onboard 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:
   i. CAT II and CAT III operations,
5.0 Training and Proficiency

ii. RVSM, MNPS, RNP operations,

iii. MEL procedures,


v. aircraft upset recovery, (Note - This can be done in most modern flight simulators),

vi. dynamic rollover, loss of tail rotor effectiveness and vortex ring for helicopters,

vii. specialized mission training where applicable,

viii. international airspace operations,

ix. aircraft servicing and ground handling,

x. EFIS, FMS, ACAS and HGS,

xi. signalling procedures for aircraft marshalls, and

xii. 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;

vii. 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.

5.3.3 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.

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_test/testing/airmen/test_standards/pilot,
   • http://www.tc.gc.ca/eng/civilaviation/standards/general-flttrain-planes-menu-486.htm
   • 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;
   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: **GM 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/](http://web.nbaa.org/public/ops/safety/manual/).

Historically, 50% of the business aviation accidents occur during approach and landing. For guidance in managing these risks, see GM 6.1, Section 3. Stabilized Approaches.

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/](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 GM 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

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 heliport¹, 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. 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.

¹ Heliports may include temporary landing sites or operating areas.
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 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.

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.

6.2.5.2 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

a. A flight to be operated at altitudes at which the atmospheric pressure in personnel compartments will be above 10,000 ft (less than 700 hPa) shall not be commenced unless sufficient stored breathing oxygen is carried to supply:
   i. all crew members and at least 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 10,000 ft. (700 hPa) and 13,000 ft. (620 hPa); and
   ii. all crew members and passengers for any period that the atmospheric pressure in compartments occupied by them will be above 13,000 ft. (less than 620 hPa).

b. A flight to be operated with a pressurized aircraft shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the cabin altitude would be above 10,000 ft. (less than 700 hPa). In addition, when an aircraft is operated at flight altitudes above 25,000 ft. or an altitude from which the aircraft cannot descend safely within four minutes to 13,000 ft., there shall be no less than a 10 minute supply of oxygen for all occupants.

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 1, 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 An 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/saf o/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.
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 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. 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 An 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.

6.4.6 An instrument approach shall be planned and conducted so as to ensure that the aircraft adheres to the minimum safe altitudes while in transition or on approach.

Note: For further information on this issue see: http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/all_info/media/2011/InFO11009.pdf

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.

6.4.8 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 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.

6.5.2 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.

6.6 RNP, MNPS, RNAV & RVSM

6.6.1 Prior to operation in Required Navigation Performance (RNP), Minimum Navigation Performance Specification (MNPS), Area Navigation (RNAV) or Reduced Vertical Separation Minimum (RVSM) (including D-RVSM) airspace, an operator shall have a process to ensure that:
a. the aircraft has been authorized by the State of Registry,
b. the aircraft meets the aircraft system, airworthiness, continuing airworthiness (including maintenance personnel training) and operational requirements for the operations concerned,
c. the appropriate current operational approval has been obtained from the State of Registry/Operator, and
d. continuing RVSM height monitoring requirements have been met.

Note 1: For further information on RVSM US operators should see http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/rvsm
A link to European sources is provided at http://www.ecacnav.com/RVSM/Library.

Note 2: For information on B-RNAV and P-RNAV US operators should see FAA Advisory Circulars 90-96A and the Eurocontrol web site at http://www.ecacnav.com/PRNAV.

Guidance material is also provided in GM 7 Operations in International RVSM, MNPS or RNP Airspace.

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

tax. 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 emergency equipment on board the aircraft.

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:
a. assess the associated risks and applying appropriate mitigation to maintain an acceptable level of risk for that operation,
b. identify the management person who is authorized to approve the deviation, and
c. record the deviations, the risk assessment and related mitigation.

6.13.3 Deviations shall be made only with the express approval of all personnel involved.

Note: GM 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.
6.13.4 It is recommended that any deviation from the limits contained in this GM be supported by a comprehensive risk assessment process.

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/, the IATA web site at http://www.iata.org/whatwedo/safety/health/Pages/index.aspx 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](http://www.ibac.org/safety-management/safety-management-library).*
7.0 Operations in International, RVSM, MNPS, RNAV or RNP 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. In this section all airspace outside the territory of a State is referred to as international airspace. Aircraft bearing the nationality and registration marks of an ICAO Contracting State shall apply the rules of the air established for their nation, wherever they may be, to the extent that they do not conflict with the rules published by the State having jurisdiction over the territory overflown. 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."

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 RVSM, MNPS, RNAV & RNP Airspace Operations Qualifications

7.3.1 Flight crews engaged in operations in international, Reduced Vertical Separation Minimum (RVSM), Minimum Navigation Performance Specification (MNPS), Area Navigation (RNAV) or Required Navigation Performance (RNP) airspace must be so authorized by the chief pilot. To be considered qualified to be so authorized, each flight crew member must have completed training in the subject areas as required by the specific authorizations and as necessary to ensure competency in operations in such airspace. 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 GM 7.0.
7.4 Operational Approval and Aircraft System Requirements

Prior to operation in Required Navigation Performance (RNP), Minimum Navigation Performance Specification (MNPS), Area Navigation (RNAV) or Reduced Vertical Separation Minimum (RVSM) airspace, an operator shall have a process to ensure that:

a. the aircraft has been authorized by the State of Registry;

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

c. the appropriate current operational approval has been obtained from the State of Registry/Operator and, for certain PBN operations, the State in whose airspace the operation will be conducted; and

d. continuing RVSM height monitoring requirements have been met

7.5 Standard Operating Procedures

7.5.1 Prior to operating in international airspace involving performance based navigation, 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.

GM 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 GM 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.
8.0 Aircraft Equipment Requirements

8.2.4 Emergency power supply for electrically operated attitude indicating instruments

Aeroplanes of a maximum certificated take-off mass of over 5 700 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/lnfo09019.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

8.0 Aircraft Equipment Requirements
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 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. 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 life jacket shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

8.6.2 The operator of an aeroplanes operated on an extended flight over water shall determine the risks

\(^1\) 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.
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:

a. engaged in ‘offshore operations’; or
b. when flying at a distance from land further than 25 nm.

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](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.A 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.

8.8.2H 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 Operators shall have a process to ensure that the data base for ground proximity warning systems with predictive terrain hazard warning is kept current and pilots are 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 and pilots are 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.

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
8.0 Aircraft Equipment Requirements

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: GM 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.

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; and

m. fatigue management system as required by section 6.13.

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 5 700 kg or any aircraft engaged in commercial air transport or aerial work, shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme, authorized by the State of Registry. The design and application of the operator’s maintenance programme shall observe Human Factors principles according to the State of Registry’s guidance material. The maintenance programme shall contain the following:

a. maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilization of the aeroplane;

b. when applicable, a continuing structural integrity programme;

c. procedures for changing or deviating from a) and b) above as authorized by the State of Registry;

d. when applicable and approved by the State of Registry, condition monitoring and reliability programme descriptions for aircraft systems, components and powerplants; and
Note: For information on this issue see FAA AC 120-16F at: http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC%20120-16F.pdf

e. identification of maintenance tasks and intervals that have been specified as mandatory in approval of the type design, or approved changes to the maintenance programme.

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: GM 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.

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.

Note1: 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. These questions could be combined with other typical questions such as: policies for towing, policies for fuelling, etc.

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 also contains extensive guidance material and regulatory references.

13.3 It is recommended that operators include considerations for the safety of aircraft maintenance technicians who may be working alone.
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/medi a/MaterialsCarriedByPassengersAndCrew.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 GM 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](http://www.nbaa.org/ops/security/best-practices).

*Note 2:* Attachment B to GM 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.
GM 3.2  Safety Management System

This GM provides resources, including the new SMS Toolkit, for implementing a safety management system (SMS). In addition to the SMS Toolkit which is provided with the IS-BAO and included on the CD, operators are encouraged to review a number of the many valuable references cited in the GM. One valuable reference is the ICAO Safety Management Manual (Doc 9859-AN/460).

The goal of a safety management system is to manage safety risks as effectively as practical. 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.

The SMS Toolkit provides details on a safety management system and contains guidance material on how a safety management system could be implemented and matured. The toolkit is comprised of a booklet and a CD 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 on the IS-BAO CD.

The NBAA Prototypical Business Aviation Safety Program Manual that can be found at http://www.nbaa.org/admin/sms/manual/ and the Guidelines for the Conduct of Risk Analysis by Business Aircraft Operators that is published by IBAC (and included in the SMS Toolkit which accompanies this Standard), provide guidance on SMS elements that may be of assistance to operators.

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


b. ICAO Flight Safety Information Exchange http://www.icao.int/fsix/


d. The Transport Canada Civil Aviation web site at http://www.tc.gc.ca/civilaviation/systemsafety/pubs/menu.htm and

e. The UK Civil Aviation Authority web site at http://www.ca.as/defafault.aspx?catid=872&pageid=9953

f. The Overseas Territories web site at http://www.airssaftety.aero/safety_development/sms

g. The NASA web site at http://www.nasa.gov.


The following publications provide information on safety management systems and their application.


Excerpts From ICAO Annex 13 Aircraft Accident and Incident Investigation

ICAO Annex 13, Aircraft Accident and Incident Investigation, provides standards and recommended practices for States. ICAO Document 9756 contains supplementary (non-SARPs) information on the subject. While the Annex applies to “accidents and incidents,” it is implied that only serious incidents (see definitions) are reportable. Obviously, this varies by State.

Doc 9756 advises that notification of State authorities may be made through “local police, airport authorities or military personnel who will immediately notify the accident investigation authority in accordance with a pre-arranged procedures… a list of State authorities to be notified should be available at all air traffic services facilities, airport authorities and police departments.” A list of reporting agencies is located in Doc 9756.

Excerpts from Annex 13 included with the permission of the International Civil Aviation Organization:

“3.1 The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

3.3 The State of Occurrence shall take all reasonable measures to protect the evidence and to maintain safe custody of the aircraft and its contents for such a period as may be necessary for the purposes of an investigation. Protection of evidence shall include the preservation, by photographic or other means of any evidence which might be removed, effaced, lost or destroyed. Safe custody shall include protection against further damage, access by unauthorized persons, pilfering and deterioration.

3.4 If a request is received from the State of Registry, the State of the Operator, the State of Design or the State of Manufacture that the aircraft, its contents, and any other evidence remain undisturbed pending inspection by an accredited representative of the requesting State, the State of Occurrence shall take all necessary steps to comply with such request, so far as this is reasonably practicable and compatible with the proper conduct of the investigation; provided that the aircraft may be moved to the extent necessary to extricate persons, animals, mail and valuables, to prevent destruction by fire or other causes, or to eliminate any danger or obstruction to air navigation, to other transport or to the public, and provided that it does not result in undue delay in returning the aircraft to service where this is practicable.

4.1 The State of Occurrence shall forward a notification of an accident or serious incident with a minimum of delay and by the most suitable and quickest means available to:

   a) the State of Registry;
   b) the State of the Operator;
   c) the State of Design;
   d) the State of Manufacture; and
   e) the International Civil Aviation Organization, when the aircraft involved is of a maximum mass of over 2 250 kg.

4.6 Upon receipt of the notification, the State of Registry, the State of the Operator, the State of Design and the State of Manufacture shall, as soon as possible, provide the State of Occurrence with any relevant information available to them regarding the aircraft and flight crew involved in the accident or serious incident. Each State shall also inform the State of Occurrence whether it intends to appoint an accredited representative and if such an accredited representative is appointed, the name
and contact details; as well as the expected date of arrival if the accredited representative will travel to the State of Occurrence.

5.18 The State of Registry, the State of the Operator, the State of Design and the State of Manufacture shall each be entitled to appoint an accredited representative to participate in the investigation.

Note. - Nothing in this Standard is intended to preclude the State that designed or manufactured the powerplant or major components of the aircraft from requesting participation in the investigation of an accident.

5.19 The State of Registry or the State of the Operator shall appoint one or more advisers, proposed by the operator, to assist its accredited representative.

5.24 A State entitled to appoint an accredited representative shall also be entitled to appoint one or more advisers to assist the accredited representative in the investigation.

Note 1. - Nothing in the above provisions is intended to preclude a State participating in an investigation from calling upon the best technical experts from any source and appointing such experts as advisers to its accredited representative.

Note 2. - Facilitation of the entry of the accredited representatives, their advisers and equipment is covered in Annex 9 — Facilitation. The carriage of an official or service passport may expedite the entry.

5.24.1 Advisers assisting accredited representatives shall be permitted, under the accredited representatives’ supervision, to participate in the investigation to the extent necessary to enable the accredited representatives to make their participation effective.

Definitions:

Accident. An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

a) a person is fatally or seriously injured as a result of:
   • being in the aircraft, or
   • direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
   • direct exposure to jet blast,
   except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which:
   • adversely affects the structural strength, performance or flight characteristics of the aircraft, and
• would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or
  c) the aircraft is missing or is completely inaccessible.

... Serious injury. An injury which is sustained by a person in an accident and which:
  a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
  b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
  c) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or
  d) involves injury to any internal organ; or
  e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or
  f) involves verified exposure to infectious substances or injurious radiation.

... Serious incident. An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down. 

Note 1.— *The difference between an accident and a serious incident lies only in the result.*

Note 2.— The incidents listed are typical examples of incidents that are likely to be serious incidents. The list is not exhaustive and only serves as guidance to the definition of serious incident.

• Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.
• Controlled flight into terrain only marginally avoided.
• Aborted take-offs on a closed or engaged runway, on a taxiway\(^1\) or unassigned runway.
• Take-offs from a closed or engaged runway, from a taxiway\(^1\) or unassigned runway.
• Landings or attempted landings on a closed or engaged runway, on a taxiway\(^1\) or unassigned runway.
• Gross failures to achieve predicted performance during take-off or initial climb.
• Fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.
• Events requiring the emergency use of oxygen by the flight crew.
• Aircraft structural failures or engine disintegrations, including uncontained turbine engine failures, not classified as an accident.
• Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.
• Flight crew incapacitation in flight.
• Fuel quantity requiring the declaration of an emergency by the pilot.
• Runway incursions classified with severity A.

\(^1\) Excluding authorized operations by helicopters.
- Take-off or landing incidents. Incidents such as under-shooting, overrunning or running off the side of runways.
- System failures, weather phenomena, operations outside the approved flight envelope or other occurrences which could have caused difficulties controlling the aircraft.
- Failures of more than one system in a redundancy system mandatory for flight guidance and navigation.\(^1\)

\(^1\) Included with the permission of the International Civil Aviation Organization

*Back to 3.2 Safety Management System Requirements*
GM 4.1 Organization and Personnel Requirements

1. Organization Structure

A recommended organization structure is as follows:

![Organization Structure Diagram]

2. 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.

2.1 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.

2.2 Flight Department Manager/Director, Flight Operations

2.2.1 Responsibilities

The flight department manager/director, flight operations 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:

a. organizing, staffing and directing:
   i. flight operations,
   ii. cabin safety,
   iii. crew scheduling, and
   iv. training programmes,

b. controlling operations and operational standards of all aircraft operated,

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c. managing functions which impact on operational control (e.g. maintenance, crew scheduling, load control, equipment scheduling),
d. developing, implementing and maintaining the safety management systems,
e. developing and maintaining the company operations manual,
f. liaising with the regulatory authority on all matters concerning flight operations,
g. liaising with any external agencies which may affect aircraft operations,
h. ensuring that air operations are conducted in accordance with national and international regulations, standards and organization operating policies,
i. ensuring that crew scheduling complies with flight and duty time limitations,
j. ensuring that all crew members are kept informed of any changes to the regulations and operating standards,
k. receiving and taking action with respect to any aeronautical information affecting the safety of flight,
l. disseminating aircraft safety information, both internal and external,
m. ensuring that flight crew qualifications are current,
n. maintaining a current operations library, and
o. overseeing the welfare of flight operation personnel.

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

2.2.2 Qualifications

The flight department manager/director, flight operations must:
a. hold or have held an appropriate licence; or has acquired supervisory experience, and
b. 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.

2.3 Chief Pilot

2.3.1 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:
a. developing aircraft checklists and standard operating procedures,
b. developing and implementing all required approved training programmes for the operator flight crews,
c. issuing directives and notices to the flight crews as required,
d. ensuring that all aerodromes and routes served by the operator are operationally suitable and meet operator requirements,
e. taking action on and distributing accident, incident, and other occurrence reports,
f. processing and taking action on any flight crew reports,
g. supervising aircraft crews,
h. ensuring that all operations processes and procedures include risk management mitigation specified in the safety management system,
i. ensuring that personnel under his/her authority participate effectively in the safety management system, and
j. assuming any responsibilities delegated by the flight department manager.
2.3.2 Qualifications

The chief pilot must:

a. for aeroplanes hold a valid Airline Transport Pilot Licence valid for the category of aircraft operated.

b. for helicopters hold a commercial pilot licence valid for the category of aircraft operated.

c. if applicable, hold a type rating for at least one of the types of aircraft operated,

d. 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

e. 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.

2.4 Person Responsible for Maintenance

2.4.1 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:

a. planning and controlling all aircraft maintenance,

b. liaising with the national civil aviation authority on maintenance topics,

c. liaising with all persons or approved maintenance organizations (AMOs) performing maintenance on the operator’s aircraft,

d. ensuring that aircraft maintenance records as required by State of Registry regulations, manufacturers and operator policies are established and maintained,

e. ensuring that airworthiness directives and service bulletins that affect operator’s aircraft are complied with appropriately,

f. removing from service any aircraft that are unsafe, or that do not comply with national regulatory requirements,

g. ensuring that all operations processes and procedures include risk management mitigation specified in the safety management system,

h. ensuring that personnel under his/her authority participate effectively in the safety management system, and

i. establishing safety policies and procedures for ground operations.

Note: For operators falling under EASA rules, the duties of the person responsible for the management of the continuing airworthiness would be fulfilled by the CAMO. However, the ultimate responsibility for aircraft airworthiness remains with the owner.”

2.4.2 Qualifications

The person responsible for maintenance must have:

a. knowledge of the planning, implementation and direction of the maintenance control system for the aircraft operated, and
b. knowledge of the national regulations and standards relating to aircraft maintenance.

2.5 Safety Officer

2.5.1 Responsibilities

The safety officer 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.

2.5.2 Qualifications

The safety officer 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 officer 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 officer duties may be undertaken by the aviation manager or other qualified personnel.
2.6 Other Personnel

Depending on the size, complexity and functions of the organization other personnel specialities may be required to ensure the proper performance of the organization. These may include flight operations schedulers or dispatchers, security personnel, administrative personnel, hangar maintenance and line service personnel. The duties, authorities, and responsibilities for other personnel shall be described in the company operations manual. The lines of reporting should be clearly defined in the organization chart and in the company operations manual.

All personnel assigned any safety responsibilities need to be trained in those duties and responsibilities, including the safety management system.

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

2.6.1 Scheduler/Dispatcher, Flight Coordinator

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. 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.

Some duties and responsibilities of this position could include:
   a. scheduling travel for executives on operator aircraft or other lift alternatives such as charter,
   b. providing the flight crew with the flight plan and weather information,
   c. maintaining and updating aircraft and crew schedules to ensure compliance with operator and regulatory requirements,
   d. obtaining international permits and visas and coordinating with outside aircraft service handlers for international flights, if applicable,
   e. maintaining department records,
   f. maintaining inventories of charts and related flight crew materials,
   g. coordinating aircraft handling and fuelling with fixed base operators,
   h. maintaining a flight following system,
   i. coordinating maintenance on the aircraft,
   j. developing and maintaining security policies or procedures and communicating these procedures as needed to passengers,
   k. interfacing with flight crews, management, maintenance, and passengers,
   l. scheduling ground transportation and accommodations,
   m. arranging catering, and
   n. participating in the safety management system.

2.6.2 Hangar Maintenance and Line Service Personnel

Duties and responsibilities of these positions could include:
a. refuelling the aircraft,
b. moving or towing the aircraft,
c. cleaning and restocking the aircraft,
d. assisting in routine maintenance,
e. assisting in pre-flight checks,
f. assisting passengers,
g. monitoring and maintaining the fuel farm and inventories,
h. de-icing the aircraft,
i. maintaining the hangar facility, and
j. participating in the safety management system.

2.6.3 Cabin Crew

Cabin crew duties may include:

k. performing duties as assigned by the pilot in command,
l. providing emergency medical assistance for passengers when required,
m. conducting pre-flight aircraft procedures and ensuring that all safety, galley and cabin equipment is ready for flight,
n. maintaining order in the cabin at all times,
o. ensuring passenger briefing is in compliance with the operations manual,
p. ensuring that all carry-on items are secured and that passengers have fastened their seat belts and safety/shoulder harnesses, if installed,
q. advising flight deck crew that cabin is secured and ready for departure,
r. initiating service after aircraft has reached a safe altitude and after verifying weather conditions with the flight deck,
s. preparing passengers and cabin for arrival in compliance with the operations manual,
t. cleaning and readying the aircraft and advising the flight deck crew of any cabin discrepancies,
u. planning menus and ordering catering,
v. ensuring food safety, and
w. participating in the safety management system.

2.6.3 Other Personnel Serving Onboard the Aircraft

Organizations may elect to carry additional personnel such as a cabin person providing in-flight service duties, or a flight technician. It is important that the roles and responsibilities of these other persons be clearly defined and communicated so that passengers understand any limits of safety qualification and do not wait in an emergency situation or rely on a person for safety direction, who is not trained or qualified for that function. Personnel should be trained for their assigned duties and responsibilities. Duties of these positions could include:

Service oriented person:

a. customer service,
b. planning menus and ordering catering,
c. securing the galley,
d. ensuring food safety
4.1 Organization & Personnel Requirements

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GM 5.1 Training Programmes

This GM 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.

As the guidance provided in this GM 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.

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

1. Training Facilities

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

2. 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.

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.

3. Crew Training on a Contract Basis

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. 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:
5.1 Training Programmes

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.

5. 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.

6. 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.

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

   i. use of aircraft checklists;

   ii. flight and cabin crew resource management training;

   iii. aircraft fire on the ground and while airborne;

   iv. engine fire or failure;

   v. effects of engine icing and anti-ice operation;

   vi. take-off, landing and when applicable, flight with critical engine inoperative including driftdown and engine inoperative performance capabilities;

   vii. loss of pressurization and emergency descent (as applicable);

   viii. flight control failures and degraded states of operation;

   ix. hydraulic, electrical and other system failures;

   x. failure of navigation and communication equipment;

   xi. pilot incapacitation;

   xii. approach to the stall (ground contact imminent and ground contact not a factor) (as applicable);

   xiii. 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);

   xiv. aircraft performance for climb, cruise, holding, descent, landing and diversion;
xv. normal, noise abatement and maximum performance take-off;
xvi. 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);
xvii. rejected take-off procedures and rejected landings;
xviii. passenger and crew evacuation; and
xix. FMS, GPWS/TAWS, TCAS, ACAS and other specialized equipment installed in the aircraft, as applicable.

b. Flight planning and instrument flight procedures:
i. departure, en-route, holding, arrival and in-flight diversion;
ii. precision, non-precision and missed approaches in minimum visibility conditions;
iii. precision, non-precision and missed approaches using automatic, flight director and degraded states of operation;
iv. Category II and Category III approaches, as applicable; and
v. testing and reviews.

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

7. Flight Simulator Only

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.

7.1 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.

a. manoeuvring of the aircraft on the ground;
b. crosswind take-off and landings to 100% of the certificated crosswind component;
c. contaminated runway and crosswind take-off and landings to published demonstrated crosswind component (as applicable); and
d. 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).

7.2 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.

8. 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:

a. use of aircraft checklists;
b. manoeuvring of the aircraft on the ground;
c. crew resource management;
d. simulated aircraft fire on the ground and while airborne;
e. simulated engine fire or failure;
f. briefings on effects of airframe and engine icing and anti-ice operation;
g. 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);
h. simulated loss of pressurization and emergency descent (as applicable);
i. simulated flight control failures and degraded states of operation, while in-flight, and during take-off and landing (as applicable);
j. simulated hydraulic, electrical and other system failures;
k. operation and simulated failure of navigation and communication equipment;
l. pilot incapacitation;
m. briefing for recognition and recovery from turbulence and windshear on approach, landing and take-off;
n. 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);
o. aircraft performance for climb, cruise, descent, landing and diversion;
p. normal, noise abatement and maximum performance take-off and landing;
q. crosswind take-off and landings, and briefing on simulated contaminated runway take-off and landings;

r. slope, confined area and pinnacle take-off and landings and elevated heliport operations as applicable for helicopters;
s. aircraft performance calculations, including take-off and landing speeds, weight and balance and centre of gravity;
t. simulated rejected take-offs and landings;
u. passenger and crew emergency evacuation; and

v. FMS, GPWS/TAWS, TCAS, ACAS and other specialized equipment installed in the aircraft equipment, as applicable.


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.

10. Minimum Navigation Performance Specifications (MNPS) Training

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
11. 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

12. 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.

13. 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

14. Low Visibility Take-off Weather Minima

a. Ground Training:
5.1 Training Programmes

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):
   i. one completed take-off at RVR 600 ft./200 m, and
   ii. 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.

15. 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 initial course; and
   c. special authorization qualification (e.g. lower take-off limits, etc.).

16. 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.

17. 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.

18. Aircraft Surface Contamination Training

Operating personnel should receive training in the following areas:
   a. aircraft crew initial de-icing/anti-icing training;
      i. the effect of contamination on a critical surface;
      ii. aircraft de-icing/anti-icing procedures; and
      iii. 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:
   i. the effect of contamination on critical surfaces;
   ii. aircraft de-icing/anti-icing procedures; and
   iii. aircraft inspection procedures; and

d. recurrent de-icing/anti-icing ground maintenance procedures training every two years.

19. MEL Training (as applicable)

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

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

2. General MEL Content:
   a. approval letter,
   b. list of effective pages,
   c. table of contents,
   d. preamble,
   e. definitions, and
   f. ATA Chapters, Page format, Page numbering, System and item titles, categorization, columns, remarks and exceptions, placarding, (O) and (M) procedures.

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

20. 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;
1. 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

21. 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.

22. 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.

23. 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.

24. Operational Ground Support Personnel

Personnel involved is 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.

25. 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.

Back to 5.1 Training Programs
GM 6.1 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.

1. **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.
2. 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/.

Back to 6.1 Standard Operating Procedures

3. 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:

- The landing gear is down, landing flaps set, trim set, and fuel balanced per the AFM or POH, as applicable.
- 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.
- 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.
- 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.
- Indicated airspeed is between Vref and Vref + 20, or acceptable ranges specified in the AFM or POH, as applicable.
- 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:
GM 6.13  Fatigue Management

1.  Introduction

This GM presents guidance 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 forgoing 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)

2  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 changes². 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.

1.  Duty period length is related to the continuous hours of wakefulness through a subset. Flight time is a subset of duty period.
2.  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.

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

4. 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:

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

2. Flight and duty time limits based on sound scientific research,

3. Scheduling practices that carefully consider the safety-risks associated with fatigue and its cumulative effects,

4. Mechanisms that ensure that employees report on situations where fatigue became an issue,

5. Processes to empirically analyse all reports considering core physiological factors\(^1\), 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).

3. 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.

4. 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 home-base/domicile time for the point of departure. Recommended 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></td>
<td>Per 24-hour Period</td>
<td>Per Week</td>
</tr>
<tr>
<td>Two Pilots</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) ... or ... minimum 48 continuous hours in a 10-day period</td>
<td>48 continuous hours on return home following duty period across multiple time zones</td>
</tr>
<tr>
<td>Three Pilots</td>
<td>Reclining seat 18 hours</td>
<td>16 hours **</td>
</tr>
<tr>
<td>(Augmented)</td>
<td>Supine bunk 20 hours</td>
<td>18 hours **</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
Table 2
Flight 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

<table>
<thead>
<tr>
<th>Off Duty</th>
<th>Duty Period</th>
<th>Flight Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per 24-hour Period</td>
<td>Per Week</td>
</tr>
<tr>
<td>Two Pilots</td>
<td>12 hours</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>
</tr>
<tr>
<td>No two pilot extensions recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three Pilots (Augmented)</td>
<td>12 hours</td>
<td>Same as above</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
5. **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:

- 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”

6. **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.

**Work Schedules**

- 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.

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.

Morning/Day Shifts
2. 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.
3. Limits on the number of successive early start shifts should also be considered.

Weekly Limits
4. As fatigue accumulates over successive work periods weekly work limits should be established.
5. 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.

Additional Considerations
6. 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.
7. Aircraft maintenance personnel should be required to report for duty adequately rested.

7. 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.

8. Additional References

Additional material on fatigue management is available from the following sources:
• 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 web site at http://human-factors.arc.nasa.gov/


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

• FAA Maintenance Fatigue info at: https://hfskyway.faa.gov/HFSkyway/FatigueHome.aspx.

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

Back to 6.13 Fatigue Management
GM 7.0 Operations in International, RVSM, MNPS, RNAV or RNP Airspace

The guidance material in this chapter relates primarily to operations in international airspace but also includes considerations for domestic airspace where RVSM, MNPS, RNAV and RNP airspace exists. The procedures contained in this chapter may be used for both domestic and international applications.

1.0 Operating Requirements

1.1 Flight Crew Training and Authorization

All airspace outside the territory of States is international airspace. Crews must be familiar with the relationship between State Regulations and the ICAO Rules of the Air when operating in international airspace. The operator training program should be designed to provide that familiarization. Prior to operating in international airspace, flight crew members should complete the general training program specified in section 3 and the specific training programs specified for the area or airspace type, in which the operation is to be conducted. They also should be specifically authorized for operation in international airspace by the chief pilot.

A recurrent training program should also be established.

The training and authorization should be recorded on the crew member’s training record.

1.2 Aircraft Approval and Operator Authorization – MNPS, RNAV, RNP & RVSM

ICAO Standards have specific requirements for approval of aircraft by the State of Registry and/or the Operator, for operations in MNPS, RNAV, RNP or RVSM (including D-RVSM) airspace. A list of those aircraft that have received such approvals and the approval validity period should be recorded in the company operations manual.

A copy of the approval documents for MNPS, RNAV, RNP and RVSM (including D-RVSM) should also be kept in the aircraft. PICs must confirm presence and validity prior to operations in international, MNPS, RNAV, RNP or RVSM airspace, and that all specified aircraft system and maintenance requirements have been met.

The new ICAO Performance Based Navigation (PBN) concept specifies that aircraft RNAV system performance requirements be defined in terms of the accuracy, integrity, availability, continuity and functionality, which are needed for the proposed operations in the context of a particular airspace concept. The PBN concept represents a shift from sensor-based to performance-based navigation. Performance requirements are identified in navigation specifications, which also identify the choice of navigation sensors and equipment that may be used to meet the performance requirements. These navigation specifications are defined at a sufficient level of detail to facilitate global harmonization by providing specific implementation guidance for States and operators. However, PBN identifies several airspace specifications. Existing specifications include:

a. RNAV 10 (RNP 10) Airspace (Oceanic and Remote)
b. RNAV 5 Airspace (En-route and Continental Airspace)
c. RNAV 2 Airspace (En-route Continental and Terminal Airspace)
d. RNAV 1 Airspace (Terminal Airspace)
e. RNP 4 Airspace (Oceanic and Remote)
7.0 Operations in International RVSM, MNPS or RNP Airspace

f. Basic RNP 1 (Terminal Airspace)
g. RNP AR APCH (Approach)
h. RNP APCH (Approach)

Specifications currently not covered by existing specifications in PBN:
   a. Advanced RNP 1
   b. RNP 2

For further information see the current edition of ICAO Document 9613, *Performance Based Navigation* and national AIP.

1.3 Procedures

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](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

It is recommended that these documents be used to develop an International Airspace SOP. The following is an example of such a manual.

2.0 Standard Operating Procedures

2.1 General Provisions

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.

2.2 Aircraft System Requirements

2.2.1 MNPS Airspace

To enter MNPS airspace on an unrestricted basis the following navigation equipment must be operating:

a. Two operating and independent navigation systems consisting of any combination of Inertial Navigation Systems (INS) and/or Global Position Systems (GPS); or
b. Two Flight Management Systems (FMS) with any combination of long-range navigation sensors comprised of Inertial Reference Systems (IRS) and/or Global Positioning System.

Aircraft may fly through the NAT MNPS airspace on a restricted basis with just a single navigation system or single FMS as long as the special use routes (Blue Spruce Routes) are utilized and:

a. The installed navigation system or FMS is MNPS certified; and
b. The aircraft has operable ADF, VOR, or VOR/DME.

Any GPS installation must be done in accordance with the FAA Technical Standard Order (TSO) C129 or national equivalent, and be equipped with Receiver Autonomous Integrity Monitoring (RAIM). Where GPS is the primary means of navigation available, the installation must be done in accordance with FAA Order 8110.6 or national equivalent, and additionally include Fault Detection and Exclusion (FDE). When using GPS as the only means of long-range navigation, an FDE predictive check must be carried out prior to flight to determine that enough satellites with the proper geometry will be available along the entire route of flight. If there are insufficient satellites available the flight must be re-routed, re-scheduled or cancelled. Any FDE prediction software program used must use the same algorithms as the GPS receiver.

2.2.2 RNAV 10 Airspace (RNP 10 LABEL)

Operation within –RNAV 10 designated airspace requires the aircraft to be equipped with long-range navigation systems or FMS with appropriate sensors that have a cross-track and along track error of less than 10 NM 95% of the time. This includes position, flight technical, path definition and display errors.

To enter the airspace, the following navigation equipment must be installed and fully operational:

a. Two independent navigation systems consisting of any combination of Inertial Navigation Systems (INS) and/or Global Position Systems (GPS); or
b. Two Flight Management Systems (FMS) with any combination of long-range navigation sensors comprised of Inertial Reference Systems (IRS) and/or Global Positioning Systems.
The drift rate for INS or IRS systems must be considered when calculating time limits in RNP – 10 airspace. For example, if the approval of the inertial navigation platforms is based on an assumed drift at the rate of 1.6 NM per hour, an aircraft with only dual INS or dual IRS installations would be limited to a total of 6.2 hours operating time from putting the inertial platform in the Nav mode. If the INS or an FMS position is updated, additional time is allotted. If the system(s) receives an update based on DME/DME, then operation for an additional 5.9 hours is allowed from the time of the update. If the system(s) receives an update based on VOR/DME, then operation for an additional 5.7 hours is allowed. If the system(s) is capable of accepting a manual update, then continued operation for an additional 5.2 hours is allowed.

It is important that anticipated headwinds be taken into account when calculating forecast time in the airspace.

2.2.3 **BRNAV Airspace**

Aircraft must be equipped with at least one basic RNAV system and have navigation equipment capable of operating to RNAV 5 accuracy. The following equipment is required for operating in BRNAV airspace:

a. One RNAV system capable of:
   i. continuous indication of aircraft position relative to track to be displayed to the pilot flying on a navigation display situated in his primary field of view;
   ii. display of distance and bearing to the active (To) waypoint;
   iii. display of ground speed or time to the active (To) waypoint;
   iv. storing a minimum of four waypoints; and
   v. appropriate failure indication of the RNAV system, including the sensors.

b. Navigation system(s) capable of meeting RNAV 5 criteria, including:
   i. VOR or VOR/DME using conventional navigation; or
   ii. RNAV systems using:
      A. IRS positioning (2 hour limit if IRS only);
      B. GPS positioning (FDE predictive checks if GPS only);
      C. DME/DME updating; or
      D. VOR/DME updating.

Correct operation of the aircraft RNAV system shall be established before joining and maintained during operation on an RNAV route. This shall include confirmation that:

a. the routing is in accordance with the clearance; and
b. the aircraft navigation accuracy meets RNAV 5.

2.2.4 **RNP 4 Airspace**

The use of RNP 4 was introduced in some Pacific Region airspace in November 2004 and it is anticipated that it will also be introduced in other regions. For information on aircraft, navigation system, data base, operating procedures and flight crew training requirements see:

- ICAO document *Attachment to State Letter AN 13/33.7-04/86 GUIDANCE FOR AN RNP 4 OPERATIONAL APPROVAL PROCESS FOR INITIAL APPLICATION IN OCEANIC OR REMOTE AIRSPACE*.
- FAA Order 8400.33
2.2.5 **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.

For further information US operators should see [http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/rvsm](http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/rvsm). A link to European sources is provided [http://www.ecacnav.com/RVSM/Library](http://www.ecacnav.com/RVSM/Library).

2.3 **MNPS, RNAV and RNP Procedures**

2.3.1 **General**

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.

2.3.2 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.

2.3.3 The Use of a Master Document for operations in International Airspace

A master working document is to be used on the flight deck. A master document is defined as being a computerized flight plan, a navigation log, or any other document that includes a sequential list of the waypoints defining the route, the track and distance between each waypoint, and other information relevant to navigation along the cleared track. Misuse of the Master Document can result in GNEs occurring and for this reason the following procedures shall be followed:

a. Only one Master Document to be used on the flight deck. However, this does not preclude other crew members maintaining a separate flight log.
b. On INS equipped aircraft a waypoint numbering sequence should be established from the outset of the flight and entered on the Master Document.
c. FMS generated or inserted waypoints should be carefully compared to Master Document
d. Master Document waypoints should be cross checked by both pilots.
e. An appropriate symbology will be adopted to indicate the status of each waypoint listed on the Master Document. The following is the system that will be used:
   i. The waypoint indicator used in the aircraft system is entered against the corresponding waypoint coordinates in the Master Document to indicate that the waypoint has been inserted in the navigation computers.
   ii. The waypoint number is circled, to signify that insertion of the correct coordinates in the navigation computers has been double-checked independently by another crew member.
   iii. The circled waypoint number is ticked, to signify that the relevant track and distance information have been double-checked.
   iv. The circled waypoint number is crossed out, to signify that the aircraft has overflown the waypoint concerned.
f. All navigational information appearing on the Master Document must be checked against the best available prime source data. When an ATC track change is received or the ATC clearance is otherwise updated, it is recommended that a new Master Document be prepared for the changed portion of the flight. If the original Master Document is to be used, the old waypoints should be clearly crossed out and the new ones entered in their place.
g. When ATC clearances are being obtained two flight crew members should monitor such clearances, one of them recording the clearance on the Master Document as it is received, the other checking the receipt and monitoring the read-back for correctness. All waypoint coordinates should be read back in detail.

2.3.4 Position Plotting for Operations in International Airspace
Flight crews will use a simple plotting chart to provide a visual presentation of the intended route that is defined only in terms of navigational coordinates. As the flight progresses, plotting the aircraft's position on this chart will also serve the purpose of a gross navigation error check, and will help to confirm that the flight is proceeding in accordance with its clearance. If the plotted position is laterally offset, the flight may be deviating unintentionally and this possibility should be investigated at once.

### 2.3.5 Pre-flight Procedures

**Navigation systems pre-flight requirements**

- **a. Independent Navigation Systems:**
  - i. **INS only:**
    - A. ensure that the correct present position inserted and system properly aligned.; and
    - B. check the time limits if flying in designated RNP or RNAV airspace;
  - ii. **GPS only certified to primary means:**
    - A. perform FDE predictive check;
    - B. download appropriate almanac from the US Coast Guard Web Site [http://www.navcen.uscg.gov/?pageName=gpsAlmanacs](http://www.navcen.uscg.gov/?pageName=gpsAlmanacs) and load it into the FDE predictive program on the computer;
    - C. determine satellites to be out of service during the planned flight at [http://www.navcen.uscg.gov/?pageName=GPSSOI](http://www.navcen.uscg.gov/?pageName=GPSSOI) and load the information into the FDE predictive program on your computer;
    - D. load the planned flight plan into the FDE predictive program on your computer; and
    - E. with the information loaded, execute the program and determine whether a sufficient number of satellites are available along the planned route of flight;

- **b. INS/GPS equipped:**
  - A. no timing considerations; and
  - B. FDE predictive check not required;

- **c. Flight Management System:**
  - i. **with IRS as primary sensor:**
    - A. ensure that the correct present position loaded into the IRSs and systems properly aligned; and
    - B. check the time limits for operating in designated RNP airspace;
  - ii. **with GPS certified to primary means:**
    - A. perform the FDE predictive check;
    - B. download the appropriate almanac from the US Coast Guard Web Site [http://www.navcen.uscg.gov/?pageName=gpsAlmanacs](http://www.navcen.uscg.gov/?pageName=gpsAlmanacs) and load it into the FDE predictive program on the computer;
    - C. determine satellites to be out of service during the planned flight at [http://www.navcen.uscg.gov/?pageName=GPSSOI](http://www.navcen.uscg.gov/?pageName=GPSSOI) and load the information into the FDE predictive program on your computer;
    - D. load the planned flight plan into the FDE predictive program on your computer; and
    - E. with information loaded into the computer, execute the program to determine whether a sufficient number of satellites are available along the entire route of flight and
**Note** - If equipped with Honeywell GNS/XLS the predictive program is internal to the unit in the aircraft. The satellites expected to be unserviceable must still be loaded into the unit but the almanac information is received from the satellites when the receiver is turned on.

iii. integrated FMS with IRS, GPS, DME/DME, VOR/DME:
   A. no timing considerations; and
   B. FDE predictive check not required.

**Loading the navigation system/FMS**

a. Manually:
   i. one pilot loads independently of the other;
   ii. the second pilot verifies the accuracy of the information loaded independently of the first;
   iii. both pilots compare the master document and navigation system/FMS:
       A. check each leg distance from the master document; and
       B. check each track vs. magnetic course from the master document;

b. Loading from a floppy diskette:
   i. both pilots check;
       A. waypoint coordinates for correctness;
       B. each leg distance comparing the system to the master document; and
       C. each track vs. magnetic course comparing the system to the master document;

c. Data Link upload:
   i. both pilots check the correctness of the waypoints;
       A. waypoint coordinates for correctness;
       B. each leg distance comparing the system to the master document; and
       C. each track vs. magnetic course comparing the system to the master document;

d. using the master document indicate that each check has been performed;
   i. as each waypoint is loaded circle the waypoint number/name on the master document;
   ii. as each waypoint is checked place a check mark beside the circle on the master document;
   iii. as each leg distance is checked highlight or underline it on the master document;
   iv. as each track is checked against magnetic course highlight or underline it on the master document; and
   v. as each waypoint is passed in flight cross off the waypoint on the master document;

2.3.6 **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:
   i. confirm navigation system/FMS switches to next waypoint;
   ii. compare the distance to next waypoint on the navigation system/FMS to master document for agreement; and
   iii. compare the track on the navigation system/FMS to the magnetic course on the master document for agreement;

b. ten minutes past the waypoint:
   i. record the navigation system/FMS position on the plotting chart; and
   ii. 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.

2.3.7 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.

2.4 Reduced Vertical Separation Minima (RVSM) Procedures

2.4.1 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);

b. Check reported and forecast weather conditions on the route of flight;

c. Check minimum equipment requirements pertaining to height-keeping systems; and
d. If required for the specific aircraft group, account for any aircraft operating restrictions related to RVSM airworthiness approval.

2.4.2 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.

2.4.3 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.

2.4.4 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:

i. the normal pilot scan of cockpit instruments should suffice for altimeter cross-checking on most flights, and

ii. 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;

iii. 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;

iv. 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.

2.4.5 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.

2.5 Routing

Aircraft navigating through international airspace may choose to use random routings. Random routings allow the operator or a computer, to choose the latitude and longitude of the waypoints used to define a course. Waypoints used to define a route must meet the criteria established in Appendix 2 of ICAO Annex 11 – Air Traffic Services.

Some Flight Information Regions (FIR) have established permanent published routes through international airspace. For operations on these published routes the appropriate AIP should be consulted.

Provisions for establishing a NAT track system are identified in the Regional Supplementary Procedures NAT Region, Chapter 6.4. Provisions for establishing the Pacific Organized Track Systems (PACOTS) are identified in the Regional Supplementary Procedures PAC Region, Chapter 9.2 and are published in the appropriate AIPs

Use of the Polar routes operating through Russia may require the use of Controller - Pilot Datalink Communications.

2.6 Oceanic Clearances

An Oceanic clearance is required before entering any oceanic airspace. However, if entering New York Oceanic airspace from the South and an Oceanic clearance or the elements of one (route, altitude, and mach number), have not been received, the pilot should proceed on the cleared route into oceanic airspace and continue to request the clearance elements needed.

Oceanic clearances may be obtained by:
  a. VHF - when within a coverage area;
  b. HF - through appropriate radio station;
  c. request through domestic or other ATS agencies;
  d. Data link from participating centres; and
  e. on the ground at some locations.

The content of an Oceanic clearance is:
  a. Abbreviated clearance when flying the full length of a tack or polar route;
     i. Track and code letter
     ii. Cleared flight level
     iii. Cleared Mach number
     iv. If designated to report Met information
        
        Note - Crew read back confirms their possession of current track message.
b. Clearance on a random route  
   i. The full route given as coordinates defining the waypoints  
   ii. Cleared flight level  
   iii. Cleared Mach number  

*Note:* Crew must read back the entire clearance. An abbreviated read back may not be given.  

*Note:* If cleared by oceanic as filed the crew must read back the entire route to verify receipt of correct routing.  

*Note:* If any doubt exists as to the track message identifier, ask oceanic for a full route clearance. Oceanic Control will then ask for a full route read-back.  

**When Able Higher (WAH) Reports**  
When required or when otherwise provided, upon entering an oceanic FIR, pilots should include in the initial position report the time or location that the flight will be able to accept the next higher altitude. A WAH Report must be provided by all flights entering the MNPS Airspace portion of the New York OCA and entering the Santa Maria OCA. Shanwick expects a WAH altitude with the request for an Oceanic clearance. Provision of WAH Reports on entering other NAT OCAs is optional or they may be requested by any OAC.  

Prior advice to ATS of the time or position that a flight will be able to accept the next higher level can assist ATS in ensuring optimal usage of available flight levels.  

### 2.7 Communications and Position Reporting  

**VHF Communications**  
Flight crews are expected to monitor the emergency frequency 121.5 MHz during flights over oceanic airspace as well as over remote areas. The frequency 123.45 MHz has been assigned world-wide as an air-to-air communications channel for use out of range of VHF ground stations for the exchange of necessary operational information and to facilitate resolution of operational problems. This is reserved for operational use and not for personal discussions. (Feel free to so remind blatant abusers.)  

**HF Communications - SELCAL**  
When using HF communications, pilots should maintain a listening watch on the assigned frequency, unless SELCAL is fitted, in which case they should ensure the following sequence of actions:  

a. Provision of the SELCAL code in the flight plan. Any subsequent change of aircraft for a flight will require passing the new SELCAL information to the OAC.  

b. Checking the operation of the SELCAL equipment, at or prior to entry into Oceanic airspace, with the appropriate aeradio station. This SELCAL check must be completed prior to commencing SELCAL watch.  

**HF Communications Failure**  
In the event of failure of HF communications every effort should be made by the pilot to relay position reports through other aircraft on frequency 123.45. Pilots of aircraft which are Satellite Communications (SATCOM) equipped, who have experienced total HF failure or are otherwise unable to communicate on HF and are unable to relay by any other means, may, as a last resort, make contact via SATCOM.  

**Position Reporting**  
Position reports must be given:  

a. at all mandatory reporting points when operating on a published route;
b. at each set of coordinates defining the track when operating on an organized track;
c. at each of the significant points defining the route in Field 15 (the en-route block) of the ICAO flight plan when operating on a random route;
d. at least every hour when operating in the North Atlantic Region; and
e. at least every hour and twenty minutes when operating in the Pacific oceanic airspace.

Note: If operating on an organized track and designated as a met Aircraft, weather reports, including midpoint weather, are to be given with the position report. If operating on a random route, weather reports, including midpoint weather, should be included with the position reports.

2.8 **Strategic Lateral Offsets (SLOP)**

Lateral offset procedures are used for both the mitigation of the increasing lateral overlap probability and wake turbulence encounters. Permitting oceanic flights to fly lateral offsets will provide an additional safety margin and mitigate the risk of conflict when abnormal events such as aircraft navigation errors, altitude deviation errors and turbulence-induced altitude-keeping errors occur. Strategic lateral offsets may be permitted in en-route oceanic or remote continental airspace.

A strategic lateral offset from centreline must be adopted by the pilot. In such cases the following procedures must be applied:

a. The decision to apply a strategic lateral offset shall be the responsibility of the flight crew.
b. The flight crew shall only apply strategic lateral offsets in airspace where such offsets have been authorized by the appropriate ATS authority and when the aircraft is equipped with automatic offset tracking capability.
c. The strategic lateral offset shall be established at a distance of 1.85 km (1 NM) or 3.7 km (2 NM) to the **right** of the centre line relative to the direction of flight.

*Note 1.* Pilots may contact other aircraft on the inter-pilot air-to-air frequency 123.45 MHz to coordinate offsets.

*Note 2.* The strategic lateral offset procedure has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, one of the three available options (centre line, 1.85 km (1 NM) or 3.7 km (2 NM) right offset) may be used.

*Note 3.* Pilots are not required to inform ATC that a strategic lateral offset is being applied.

2.9 **Emergencies, Communication Failure and Contingencies**

ICAO standards and recommended practices (SARPS) for the events named in the title of this section may be found in ICAO documents, principally *PANS ATM, Document 4444*. However, individual State procedures may differ from ICAO SARPS, therefore State and regional AIPs should be consulted during the planning phase of the flight to ensure compliance with applicable regulations and procedures.

Emergency/contingency procedures for en-route oceanic operations are contained in ICAO Doc 4444 and list the following items:

a. inability to comply with assigned clearance due to meteorological conditions, aircraft performance or pressurization failure;
b. en-route diversion across the prevailing traffic flow;
c. loss of, or significant reduction in, the required navigation capability when operating in an 
airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight 
operations.

The procedures associated with items a. and b., above, are applicable primarily when descent and/or turn-
back or diversion is required. The pilot shall take action as necessary to ensure the safety of the aircraft, 
and the pilot’s judgment shall determine the sequence of actions to be taken, having regard to the 
prevailing circumstances.

*Note: PANS ATM Doc 4444, 15th Ed., Amendment 2, effective 19 November 2009, contains significant 
changes to oceanic emergency/contingency procedures.*

### 2.10 Checklist for Pilots Not Routinely Involved in International, MNPS, RNAV or RNP 
Operations

To assist those pilots who are less familiar with operating in the MNPS/RNAV/RNP airspace, the 
following short checklist has been prepared:

a. Are you sure that your aircraft has been granted MNPS/RNAV/RNP approval by the State of 
Registry and, if applicable, has the aircraft also received RVSM approval?

b. Are you sure that as an Operator (or flight crew) that you have received the appropriate 
operational authorization from your State of Registry/Operator?

c. If it has, are the letters 'X', 'W' and 'R', as relevant, included in Field 10 of your flight plan?

d. If you are intending to follow an organized track, and bearing in mind that the OTS changes every 
12 hours, do you have a copy of the valid track message and, if applicable, any amendments to it?

e. Are you familiar with the Mach Number technique as applied in the provision of longitudinal 
separation in some airspace?

f. Does your aircraft require that a correction need to be applied to indicated Mach number to arrive 
at True Mach number?

g. Have you had an accurate time check referenced to UTC, and is the system you will be using on 
the flight deck for MNPS/RNAV/RNP operation also accurately referenced to UTC? (For the 
NAT OTS and PAC OTS use a source such as WWV, BBC, CHU or GPS time. If using GPS 
time the appropriate correction between GPS and UTC time must be applied.) Is this time 
accuracy going to be maintained for the planned duration of the flight?

h. If using GPS as a stand-alone long range navigation system, have you checked the latest 
NOTAMs regarding the serviceability of GPS satellites and have you performed an FDE 
prediction program analysis?

i. If flying via the special Greenland/Iceland routes, have you checked the serviceability both of 
your one long-range navigation facility and of the short range navigation facilities that you will 
use?

j. If flying other than on the special routes, are you sure of the serviceability of both your long-
range navigational systems?

k. Have you planned ahead for your action should you suffer a failure of one system?

If, as a pilot, you have any doubt about your answers to these questions, it may be necessary for you to 
consult with the Civil Aviation Department of your State of Registry/Operator.
3.0  Training Course Outline

The following general training program shall be completed prior to *(Operator Name)* authorization of flight crews to operate in international airspace:

a. ICAO operational rules and regulations;

b. ICAO Units of Measurement standards;

c. Sources and content of international flight publications;

d. Itinerary planning;

e. Preparation of:
   i. ICAO international flight plans; and
   ii. Navigation logs;

f. Route planning within the MNPS/RNP/RVSM airspace where flights are to be conducted;

g. En-route and terminal procedures;

h. Long-range, air-to-ground communications procedures;

i. Structure of the MNPS, RNP, RVSM & RVSM Transition airspace where the flights are to be conducted;

j. Air traffic clearances;

k. International meteorology to include:
   i. Significant weather charts;
   ii. Prognostic weather charts;
   iii. Tropopause prognostic charts;
   iv. Terminal weather forecasts (TAF); and
   v. Aviation routine weather reports (METAR);

l. Specific en-route navigation procedures for each type of navigation equipment required for use in the special use airspace, including abnormal procedures;

m. 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

n. Specialized training for operations in areas of magnetic unreliability.

The training programs for operation in specific types and classes of airspace are contained in the Qualifications and Training GM.

4.0  Reference Material

The following is a list of documents that may be considered for inclusion in the Aviation library:

a. Convention On International Civil Aviation (Document 7300);

b. ICAO Annex 2 (Rules of the Air);

c. ICAO Annex 5 (Units of Measurement to be Used in Air and Ground Operations);

d. ICAO Annex 6 (Operation of Aircraft);
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.

*Back to 7.0 Operations in International Airspace*
GM 9.1 Maintenance Control System – Other Than EASA Operators

Note: Operators to whom the EASA rules apply must meet the continuing airworthiness requirements of Regulation (EC) No 2042/2003, Annex I, Part M – Continuing Airworthiness. Accordingly, rather than the structure described in this GM, the requirements of para 9.1 would be fulfilled by:

a. the operator holding a Regulation (EC) No 2042/2003, Annex I, Subpart G continuing airworthiness management approval, or
b. the operator assigning his continuing airworthiness management responsibilities to a continuing airworthiness management organisation.

1. General

An operator’s maintenance control system should be described in the company operations manual or maintenance manual and should:

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.

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.

The operator should 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. conform with State regulatory requirements.

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 provide for the use and guidance of maintenance and operational personnel concerned, a maintenance programme acceptable to the State of Registry. The design and application of the operator’s maintenance programme shall observe Human Factors principles according to the State of Registry’s guidance material. The maintenance programme shall contain the following:

a. maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilization of the aircraft;
b. when applicable, a continuing structural integrity programme;
c. procedures for changing or deviating from a) and b) above as authorized by the State of Registry; and
d. when applicable and authorized 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.

An operator should include in the part of its operations manual that describes its maintenance control system defect reporting 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.

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. 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 met; and
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.

2. Maintenance Agreements

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.

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.

3. Description of Maintenance Control System in Operations Manual

The operations manual section or maintenance manual, which details the maintenance control system of an operator, should contain at least the following information:

a. where 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 or person or organization, and

iii. where necessary for clarity, a chart depicting the distribution of functions and lines of authority;

b. where the operator uses standards or technical data for the performance of elementary work/preventative maintenance or servicing that are other than those recommended by the manufacturer, the identification of those standards or data;

c. procedures to confirm that regulatory information and technical data appropriate to the work performed are used in respect of elementary work/preventative maintenance and servicing;

d. 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;

e. the identification of any maintenance schedule authorized by the State of Registry in respect of the operator’s aircraft;

   Note: It is not intended that the complete schedule be included in the operations manual section that details the maintenance control system. Although an operator may append a maintenance schedule to their manual, the maintenance schedule must be controlled under the schedule’s own List of Effective Pages.

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

g. a description of the assessment programme for aircraft Service Bulletins and Airworthiness Directives;

   Note: A form that may be used for this purpose is attached as Attachment A.

h. a description of the defect reporting and rectification control procedures including:

   i. the methods used to detect and report recurring defects;

   ii. unless incorporated into the MEL preamble, the procedures for scheduling the rectification of defects whose repair has been deferred, and

   iii. the procedures used to report service difficulties;

i. procedures to ensure that only parts and materials that meet regulatory requirements and manufacturer’s specifications are used in the performance of elementary work/preventative maintenance or servicing, including any details respecting part-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.

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

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

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

m. 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;

n. a compliance statement, indicating which sections of the operations manual section that details the maintenance control system are intended to address each of these requirements; and

o. the identification of any person eligible to apply for flight authorities in respect of the operator’s aircraft.
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.

4. Maintenance Personnel and Facilities

An operator should ensure that a sufficient number of personnel are employed to ensure the control of all required maintenance. This control includes but is not limited to:

a. the initial development of the maintenance schedules;

b. scheduling maintenance, elementary work/preventative maintenance and servicing to be performed within the time constraints specified in the approved maintenance schedule;

c. scheduling compliance with any airworthiness directives;

d. review and action of applicable service information;

e. the proper dispatch of aircraft, with regard to the control of defects, conformity with type design and the requirements of other operating rules;

f. ensuring that persons receive any required training prior to being authorized or assigned tasks;

g. the training and issuance of authorizations to personnel who are assigned to perform elementary work/preventative maintenance, and where appropriate the surveillance of such elementary work/preventative maintenance;

h. liaison with persons and organizations for the performance of maintenance; and

i. the initial development and the updating of the section of the company operations manual that describes the maintenance control system.

An operator should provide facilities for the management of the maintenance activities that include but are not limited to:

a. a place of business, with a fixed address;

b. communications facilities;

c. 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;

d. where the operator performs elementary work/preventative maintenance or servicing, the equipment and tools necessary to do this work; and

e. a secure, dry storage area to retain aircraft records.

The person responsible for the maintenance control system may assign management functions for specific activities relating to the controlling of maintenance where that assignment of functions is detailed in the maintenance control system. These details must include:

a. a description of the function being assigned. The description of 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

b. the identity of the person to whom they report.
5. Defect Reporting and Control

An operator’s maintenance control system should include procedures to ensure that defects detected during aircraft operation or during the performance of maintenance, elementary work/preventative maintenance or servicing are recorded.

An operator’s maintenance control system must include procedures to ensure that defects are rectified as soon as possible, but in no case later than the times identified in State of Registry regulatory requirements, including any repair time category intervals established in the operator’s Minimum Equipment List.

The defect recording system must 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.

Unless other criteria are established and approved in the maintenance control section of the operations manual, a recurring defect is normally considered to exist whenever a particular failure mode is repeated. The defect control system must ensure that the rectification of recurring defect will take into account the methodology used in previous repair attempts.

6. Technical Dispatch Instructions

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.

Where an approved MEL is in use, the technical instructions should include reference to the MEL procedures and defect control system.

Where no approved MEL is in use, the operator should include procedures and instructions to ensure that the flight crew and/or authorized certifying staff can assess defective aircraft equipment against regulatory requirements. These may be directed to other personnel involved in dispatch the aircraft, provided the duties and responsibilities of those persons are described in the section of the operations manual.

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.

7. Maintenance Training

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:
   a. 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;
   b. initial aircraft type training for aircraft maintenance personnel involved in the performance of maintenance; and
   c. 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.
8. Elementary Work/Preventative Maintenance Training

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.

9. Aircraft Servicing and Ground Handling Training for Pilots

It is often the responsibility of the flight crew to specify the type and quantity of fuel to be uploaded, and in doing so also specify any special precautions, such as aircraft balance considerations, during the fuelling process, or to request ground handling of the aircraft. Therefore, pilots should receive training in conducting and supervising aircraft servicing and ground handling. This training should include:

   a. Refuelling procedures including:
      i. types of fuel, oil and fluids used in the aircraft;
      ii. correct refuelling procedures;
      iii. procedures for checking fuel, oil and fluids and proper securing of caps;
   b. Use of tow bars and maximum nose wheel deflection when towing;
   c. Seasonal use of the parking brake;
   d. Installation of protective covers on the aircraft; and
   e. Procedures for operating in cold weather such as:
      i. moving the aircraft out of a warm hangar when precipitation is present;
      ii. procedures for applying de-icing and anti-icing fluids for the aircraft type including critical flight control post application inspections; and
      iii. engine and cabin pre-heating procedures, including proper use of related equipment.

10. Tool Control

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.
   a. How extensive will the program be?
   b. What materials will be monitored?
c. Who can perform a general inspection of the area?

d. What forms if any should be required?

e. 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.

*Back to 9.0 Aircraft Maintenance Requirements*
## Attachment A - Service Bulletin & A. D. Review Form

(Operator Name)

<table>
<thead>
<tr>
<th>S.B. or A.D. Title</th>
<th>No.</th>
</tr>
</thead>
</table>

**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:**
- **Accept** ☐ **Reject** ☐ **N/A** ☐
- Maintenance - ___________________________ ☐ ☐ ☐
- Flight Operations - ___________________________ ☐ ☐ ☐
- Cabin Crew - ___________________________ ☐ ☐ ☐
- Department Mgr. ___________________________ ☐ ☐

**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
#2009 – Rev. Date __/__/__
GM 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;

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 to 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.

Standard Operating Procedures

Standard operating procedures are a very effective safety management tool in multi-crew aircraft. It is required that an operator establishes and maintains standard operating procedures for each type of aircraft that is operated by two or more flight crew. Information on development of a SOP manual is contained in GM 6.1.

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.
Attachment G - Contents of an Operations Manual

Supplementary to Section II, Chapter 2, 2.2.3.1

1. Organization

1.1 An operations manual, which may be issued in separate parts corresponding to specific aspects of operations, provided in accordance with Section II, Chapter 2, 2.2.3.1, should contain at least the following:
   a) General;
   b) Aircraft operating information;
   c) Routes and aerodromes; and
   d) Training.

1.2 From 1 January 2006, an operations manual, which may be issued in separate parts corresponding to specific aspects of operations, provided in accordance with Section II, Chapter 2, 2.2.3.1, should be organized with the following structure:
   a) General;
   b) Aircraft operating information;
   c) Routes and aerodromes; and
   d) Training.

2. Contents

The operations manual referred to in 1.1 and 1.2 should contain at the least the following:

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.

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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).

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, 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.

Back to 10.0 Company Operations Manual
GM 15.0  Security Programmes

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.

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:
   a. national and local security officials;
   b. national and local law enforcement officials;
   c. the organization’s security officer, if applicable;
   d. national and international trade associations;
   e. air security assessment and intelligence service providers;
   f. local and foreign media reports; and
   g. organization officials posted in foreign locations, if applicable,

Security professionals can provide assistance in determining and assessing the operator’s vulnerabilities.

3. Preventive Measures

The focus of preventive security measures will be to:
   a. prevent unauthorized access to operator aircraft and facilities;
   b. prevent the unauthorized introduction of weapons or explosives onto company aircraft and into the operator’s facilities; and
   c. 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:
   a. Global Considerations
      i. Whenever possible avoid areas where there is an identified security risk;
      ii. Have a security program that is specific to your location and operation;
      iii. 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 Officer 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;

b. People and Processes
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;

b. People and Processes
vii. Confirm the identity and authority of each passenger, vendor and visitor prior to allowing access to facilities and aircraft;

b. People and Processes
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
xii. Confirm security of destination facilities.

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.

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.

6. **Sample Security Checklist**

Attachment A contains a sample security checklist that may be adopted by an operator.

*Back to 15.0 Security Programmes*
Attachment A - Sample Security Checklist

The following pages of this GM contain an example of suggested checks and actions in the event of unlawful interference or bomb threat. In developing their checklists operators should consult their aircraft flight manual.

Each destination should be assessed as presenting an insignificant, low, medium, high or critical security risk to travellers. The following guidelines describe the progressive measures that should be invoked to cater for each of these categories.

<table>
<thead>
<tr>
<th>Threat</th>
<th>Door/access panels</th>
<th>Emergency Exits</th>
<th>Aircraft Perimeter</th>
<th>Communications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Locked</td>
<td>Secured</td>
<td>Marked/Lit</td>
<td>Establish lines of communications between crew and passengers</td>
</tr>
<tr>
<td>Medium</td>
<td>Avoid proximity to public rights-of-way</td>
<td>Non-remote</td>
<td>Well-lit</td>
<td>Apply anti-tamper tape to doors/access panels</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fitted</td>
<td>Use if available</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish lines of communications between crew and passengers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Detailed check of aircraft cavities</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Refer to local representative for assessment of business risk of not travelling vs. security risk of travelling</td>
<td>Aircraft hangared</td>
<td>Apply tamper evidence security tape to doors/access panels</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mandatory</td>
<td>Local representative approved in accordance with local guidelines on the use of force</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish lines of communications between crew and passengers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The operators should also provide crews with local specialist assessments of the security situation in countries where such assessments are available. Crew members should contact operations to implement this advice.

♦ THE SAFETY OF PASSENGERS AND CREW IS PARAMOUNT AND THE OBJECTIVE IS TO SECURE THEIR SAFE RELEASE

♦ When possible, carry out the following:

Transponder .............................................. A7500
ATC ........................................................ INFORM
Fasten seat belts ...................................... ON
Cabin attendant or crew members .......... Brief - if possible

GENERAL ADVICE

In the air
♦ ..... Assess the situation to try to determine the intent of the hijacker and modify response as appropriate.
♦ Comply with initial demands without prejudicing safety.
♦ Negotiate patiently. Do not antagonize.
♦ Avoid actions/movements that might appear hostile.
♦ Explain before moving any control, switch, etc.
♦ Keep passengers calm. Prevent them from intervening.
♦ Consider passing information to controlling authorities.
♦ ..... If forced to deviate from the assigned track and cruising level,
  • follow the procedures as specified in ICAO Doc 7030 Regional Supplementary Procedures, or
  • if no applicable regional procedures have been established, proceed at a level which differs from the cruising levels normally used for IFR flight by:
    • 500 feet (150m) in an area where a vertical separation minimum of 1,000 feet (300m) is applied, or
    • 1,000 feet (300m) in an area where a vertical separation minimum of 2,000 feet (600m) is applied.
♦ Land at a suitable airfield.

On the ground
♦ ..... EXPECT THE AUTHORITIES TO TAKE CONTROL.
♦ ..... Be guided by authorities. Do not take independent action.
♦ ..... Make the hijacker do his own thinking.
IS-BAO – An International Standard for Business Aircraft Operations

15.0 Security Programme

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- Establish endurance of food, water, sanitary supplies, APU and battery. Transfer to a ground power unit as soon as possible. If possible, obtain air conditioning cart.
- Maintain hygiene. Keep door, galley and aisle clear of rubbish and equipment.

Bomb Threat on Ground

- Look after passengers’ health and comfort.

ATC and operations/handling agent ...... ALERT
- Confirm parking area.

Cabin attendant or crew members (if carried) BRIEF
- Passengers NOT to be told
- Prepare to disembark on PIC’s command (PA)
- Disembarkation procedures established. Use entry door if practical.
- Suspicious objects should not be touched.
- If taxiing, stop and disembark immediately.

Passengers..... ASSEMBLE CLEAR OF Aircraft (500m UPWIND)

Bomb Threat in Flight

- If an explosive device is expected, or a suspicious article has been found, the aircraft should be flown as normally as possible but in accordance with the following requirements.

Emergency DECLARE
- Plan to land at the nearest suitable airfield
- Consider high altitude airfield if appropriate.

Transponder SET A7700 if none assigned

Cabin Attendant (if carried) .. BRIEF
- Advise that there is a bomb threat and notify Senior Passenger.
- Organize search of cabin (if bomb found see following).
- Land as soon as possible.
- Disembark as soon as possible after landing by fastest means.

Pilots SEARCH FLIGHT DECK

Pressure controller MAINTAIN CURRENT CABIN ALTITUDE
Descent ............................. COMMENCE
    ◆ ......Reduce cabin differential pressure to zero by descending aircraft to cabin altitude (if applicable). Do not raise cabin altitude.
    ◆ Descend without delay to below FL100 or MSA if higher.
    ◆ Minimize manoeuvres / avoid turbulence

Speed .................. REDUCE WHEN PRACTICABLE

Cabin .................. DEPRESSURIZE/AIR VALVES CLOSED (if applicable)
    ◆ When at cabin altitude:
      Man. Cabin Alt Control ............... FULL INCREASE
      Dump Valve.......................... OPEN
    ◆ Leave outflow valve open for remainder of flight.

Landing Configuration .......... ESTABLISH EARLY

After Landing:

APU .................. START
Engines.................. SHUT DOWN
Lighting.................. ALL ON EXCEPT LANDING LIGHTS
PA .................. “IT IS IMPERATIVE TO LEAVE THE A/C WITHOUT DELAY. KINDLY FOLLOW THE INSTRUCTIONS”
                     (Given by the cabin attendant or pilot)
Passengers.................. ASSEMBLE CLEAR OF AIRCRAFT (500m UPWIND)

SUSPICIOUS ARTICLE OR BOMB FOUND
    ◆ ......DO NOT MOVE, TOUCH OR OPEN.
    ◆ ......Move passengers as far away as possible, and instruct them to keep heads below top of seat backs.
    ◆ ......Obtain expert advice through ATC communications.
    ◆ ......Remove Oxygen bottles and First Aid kits from the immediate vicinity. Have fire extinguishers available.
    ◆ ......Secure article in place, pack around with pillows, blankets, coats and absorbent materials. Keep article dry, but wet surrounding material.
    ◆ Only consider moving the article if its position poses an immediate threat to the aircraft and expert advice recommends this course of action. In which case, handle GENTLY, keep in same attitude. The article should be fastened using adhesive tape and supported in seat cushions, blankets, etc.
Attachment B - NBAA Voluntary Security Protocol for Part 91 Operators

Note - For latest amendments check with the NBAA.

Executive Summary

Since the events of September 11, 2001 and the creation of the Transportation Security Administration (TSA), the Nation’s general aviation community has participated in the national effort to enhance aviation security. Although TSA is responsible for all aviation security, the Aviation and Transportation Security Act of 2001 provides specific directions only for airline activities. There are no specific mandates dealing with general aviation. The National Business Aviation Association seeks to assist TSA in developing security guidelines that recognize the unique characteristics of business aviation and support TSA in meeting its responsibilities regarding aviation security.

In consideration of the above, the NBAA Security Protocol was developed to serve as the NBAA recognized and TSA endorsed standard for demonstrating an acceptable means for securing Business Aviation.

Adoption of the NBAA Security Protocol is voluntary and intended for use by business aircraft operators with a need to operate internationally and to access airports within TFRs. In addition, the NBAA Security Protocol is designed to be complied with at all times regardless of the Homeland Security Threat Condition Levels. This mitigates any requirement to enhance security procedures as the threat conditions move to higher levels of alert and provides the highest degree of security at all times.

The objectives of the NBAA Security Protocol are three-fold:
1. Offer TSA a comprehensive protocol and security process that satisfies the agency’s responsibility and future mandates regarding security for business aviation.
2. Provide business aviation with a protocol that is efficient, straightforward to implement, and cost effective.
3. Provide a protocol that, once accepted, implemented and certified by the TSA, would provide international access and increased access to TFRs.

Operators using these procedures are subject to audit by the FAA and the TSA, or designees of these federal agencies. Failure to comply with the NBAA Security Protocol will result in loss of those access privileges granted to holders of a Transportation Security Administration Access Certificate (TSAAC).

Users of this Security Protocol are encouraged to attend annual training programs related to this and future revisions to the protocol. In addition to training conducted by NBAA, training may also be completed in conjunction with an insurance carrier’s security program.

The benefits of the NBAA Security Protocol are numerous. By obtaining the endorsement of TSA, the ability to operate during times of heightened security and within security Temporary Flight Restrictions (TFR’s) is enhanced. The ability to meet the security requirements of individual airports is increased, and the security of the flight operation is maintained. This is of benefit to the operator and the Nation.
PEOPLE

Flight Department Personnel

- Establish and maintain a communications link with the company security department or the equivalent.
  - Communicate security needs to top management
- Establish a “Security” champion role (much like the Safety Champion’s role).
  - Have someone responsible for security.
- Complete annual security training.
- Background checks of flight department personnel.
  - **Responsibility of operator**
    - Credit
    - Employment
    - Professional credentials
      - An airman against whom certain violation(s) or administrative actions (See 49 CFR 1550.37 (b) 4) have been recorded in FAA’s Airman Registry shall not serve as pilot in command, co-pilot, first-officer or navigator of a registered aircraft operating under the TSAAC if such violation(s) are determined by competent authority to indicate a negligent, reckless or intentional disregard of prohibited or restricted airspace and procedures relating thereto.
  - **Responsibility of TSA**
    - Criminal history
    - Security databases
- Flight department personnel background checks will be updated no less frequently than every five years for employees and every two years for contract personnel.
  - Each flight crewmember that has a disqualifying offense must report the offense to the aircraft operator within 24 hours of the conviction or the finding of not guilty by reason of insanity.
  - If information becomes available to the aircraft operator indicating that a flight crewmember has a possible conviction for any disqualifying criminal offense, the aircraft operator must determine the status of the conviction.
  - If a disqualifying criminal offense is confirmed, the aircraft operator may not assign that individual to flight crew duties.
  - After undergoing a CHRC, any person serving as a Corporate Security Director, Security Coordinator or crewmember on a registered aircraft will be deemed to occupy a position of trust.
- Aircraft operator is responsible for verifying the completion and favorable TSA adjudication of background checks.
- Conditions to be observed.
  - Company personnel will remain diligent to changes in emotional well-being and health of all crewmembers and ground personnel. Crewmembers and ground personnel that are considered to be a risk to the safety or security of a flight will be removed from duty. (14 CFR 61.53)

Passengers

- Conditions to be observed
  - Company personnel will remain diligent to changes in emotional well-being and health of all passengers. Passengers that are considered to be a risk to the safety or security of a flight will not be allowed to board the aircraft
FACILITIES

Home Base – Operator Controlled
- Assure home facility perimeter security.
- All street-side gates and doors are to be closed and locked at all times.
- Require positive access control for all external gates and doors.
- Close and lock hangar doors when unattended.
- Activate hangar security system when unattended.
- Secure all key storage areas (food & liquor, parts & tools, etc.) when unattended.
- Have an access control management systems for keys and passes.
- Confirm passengers’ identity and authority prior to allowing access to facilities and aircraft.
- Escort all visitors on the ramp and in the hangar area.
- Use a government issued photo ID to verify identity of any visitor or vendor.
- Post emergency numbers prominently around facility.
- Assure easy access to phones or “panic buttons” in various locations (break room, hangar bay, visitor lounge, etc.).
- Be aware of your surroundings and do not be complacent—challenge strangers.
- If in doubt, deny access.
- Outdoor signage should be prominently displayed near areas of general public access warning against tampering with aircraft or unauthorized use of aircraft.

Home Base-Tenant Facility
- Comply with security measures of tenant facility.
- Be aware of facility emergency contact numbers.
- Confirm passengers’ identity and authority prior to allowing access to aircraft.
- Use a government issued ID to verify identity of any operator visitor or vendor.
- Escort all operator visitors on the ramp and in the hangar area.
- Be aware of your surroundings and do not be complacent.
- If in doubt, advise tenant facility staff.

Transient
- While having the aircraft serviced, the operator remains ultimately responsible for the aircraft security. Examples of this are:
  o Towing
  o Cleaning
  o Maintaining the aircraft
- The operator will conduct an aircraft physical security inspection prior to each flight
- Communicate with destination facility management to confirm security measures in place.
  o Technical stop.
  o Day trip.
  o Overnight trip.
- Security measures of the destination operator facilities will be followed.
- Avoid facilities that do not meet your standard of security.
- If you need to utilize a facility that does not meet your standards, supplement the level of security to achieve the appropriate security environment.
- If the level of security is in doubt, consider using an alternate facility/airport.
AIRCRAFT

Use appropriate security equipment such as any of the following:
- Door locks.
- Throttle locks.
- Propeller locks.
- Other security or surveillance equipment

Preflight
- A flight crewmember or authorized personnel must be present at all times when the aircraft is being serviced (fueling, catering, etc.).
- An aircraft physical security inspection will be conducted following aircraft servicing.
- An aircraft physical security inspection will be conducted prior to every flight in order to verify that no there are no suspicious items on board the aircraft. At a minimum, the inspection must include the following areas:
  - Externally accessible service compartments that do not require the use of tools or special equipment to gain access.
  - Wheel wells.
  - System openings and vents.
  - Lavatories.
  - Internal and external storage compartments.
  - Baggage holds.
  - Mechanical and electronic compartments that do not require the use of tools or special equipment to gain access.
- If the aircraft physical security inspection identifies any suspicious items, the crew will not attempt to remove the object and will immediately notify nearest local law enforcement official.
- Once found to be secure, crewmember remains with aircraft or aircraft is locked and unattended aircraft procedures are enacted.

Unattended
- Any unattended aircraft is to be secured in such a manner as to prevent unauthorized entry.
  - Utilize Aircraft Flight Manual recommendations (if available)
  - Close and secure emergency exits.
  - Arm alarm systems, if installed.
  - Close and lock all keyed access doors.
  - Utilize operator specific procedures for your aircraft.
- A system will be utilized to detect unauthorized entry into the aircraft and external openings. A system can be, but is not limited to, electronic security alarm and notification systems, security tape, closed circuit television with continuous monitoring, guards, etc.
  - If unauthorized entry is suspected, the crew will notify nearest law enforcement official.
- Compliance Standards
  - Unattended aircraft parked in hangar with controlled access.
  - Unattended aircraft parked on ramp with all keyed access doors closed and locked.
  - Unattended aircraft parked on ramp using alternative means of compliance such as, but not limited to:
    - Hardened throttle/quadrant lock, or
    - Prop locks for piston aircraft, or
    - Tie-down lock(s).
- NBAA Compliance Certificate
  - Clearly visible to anyone outside of aircraft.
  - Display inside secured aircraft to prevent theft of certificate.
**PROCEDURES**

- Security checklist.
  - Developed by Flight Department Manager with input from all personnel.
  - Elements to consider
    - People
    - Process
    - Aircraft
    - Facilities
    - Information
  - Department security champion responsible for currency/updates.
  - Reviewed prior to all flights.
- Authority of Pilot in Command.
  - Responsible for validating and verifying persons and accessible property.
  - Backed by Company policy and endorsement of CEO.
  - Zero tolerance for passenger pressure to avoid validating/verification check.
- Aircraft crew will positively identify and match all passengers, luggage and cargo. (No unidentified luggage or cargo will be allowed on the aircraft.)
- Passengers or flight department personnel must maintain positive control of luggage.
- Only authorized Company personnel and guests, identified in advance, are allowed to board a Company aircraft.
- Crewmembers must display photo ID on ramp and in hangar.
  - Examples of photo ID
    - IBAC Crew Card
    - Company ID
- Have a security plan specific to your location and operation.
- Proactive liaison and communication protocols with law enforcement will be maintained.
  - One-on-one
  - Local associations (Teterboro Users Group-TUG)
- Utilize a Security Response Plan and its associated resources.
  - TSA General Aviation Hotline
  - Operator/FBO partnership
- Flight Department personnel shall be observant and report any suspicious activity. The AOPA Airport Watch Program outlines the criteria to place calls and department personnel should be familiar with them. A call will be placed to “911” if immediate intervention is required unless there is another law enforcement communication protocol established for immediate intervention; otherwise, call TSA’s General Aviation Hotline, 1-866-GA-SECU(R) (1-866-427-3287). Signage with the Airport Watch Program information should be placed in public areas and in areas where pilots and/or ground personnel gather.
- Information
  - All oral and written flight information will be distributed on a “need-to-know” basis.
  - Any paper documents that might compromise the security of future operations (flight schedule, passenger manifests, contact information, etc.) shall be destroyed after use except where required by corporate policy or governmental regulation (i.e. CFRs).
  - Department personnel shall discuss schedules or flight details with others only on a “need to know” basis.
• Recurrent security training.
  o Take a fresh look.
  o Avoid repetition.
  o Prevent complacency.
• Recommended\(^1\) that all flights be conducted under positive ATC with a filed flight plan
• Temporary Flight Restrictions (excluding the Washington TFR and Presidential TFRs).
  o Flights will be conducted under IFR or VFR while under positive Air Traffic Control.
  o Flights will be conducted in accordance with the route of flight approved by ATC.
  o Always request updates from flight service, and check NOTAMS for specific (additional) requirements.
• Accurate and accessible passenger manifest for all trip legs.
• Positively match passengers to manifest by either:
  1. A government issued identification containing a picture, expiration date, name and date of birth, or
  2. A biometric “trusted/registered traveler” card approved by the TSA/FAA or
  3. Other method to positively identify passengers.
    • Lead passenger (identified by methods 1 or 2) can identify other passengers provided a duress situation has not been communicated
    Note: This check does not apply to children under 15 years of age.
• Any luggage not matched with a passenger or aircraft crewmember will not be placed on board the aircraft.
  o The crew may allow unaccompanied company material on board the aircraft only if the material has been inspected for suspicious items. If any objects are found, the crew will immediately notify local law enforcement officials for further inspection.

\(^1\) Revision 1 - 05 May 2003
APPENDIX A to Attachment B

Emergency Contact Numbers

FOR IMMEDIATE INTERVENTION

911

TO REPORT SUSPICIOUS ACTIVITY

1-866-GA-SECUR(E)/1-866-427-3287

COMPANY AND/OR AIRPORT CONTACT NUMBERS

<Insert here>

Emergency Procedures—GROUND

- Duress communication.
  - Passenger to crew.
  - Crew/Passenger to dispatch.
  - Crew to ATC.
  - Crew to ground personnel.
  - A notification system (such as coded phrases, electronic notification, sounds, gestures, etc.) developed by the company will be utilized in the event of an attempted hijack or sabotage threats of a Company Aircraft. This notification is to be used should a passenger, flight crewmember, flight control, maintenance, or other Aviation Division personnel be put under duress. The procedure is designed to notify the pilot-in-command, other appropriate personnel and law enforcement offices when the aircraft is on the ground and ATC during flight. In the event that a passenger communicates a duress situation to a flight crewmember, the flight crewmember will:
    - If on the ground, make every effort to communicate the situation to ground personnel and to seek assistance. The crew will use any means available to disable the aircraft and will not take off.
    - If in flight, the crew will communicate the situation to ATC. Appropriate steps will be taken by the crew to resist attempts by others to take over the aircraft. For example, the crew could divert the aircraft due to a “mechanical situation.”
- Aircraft disabling procedures.
  - Before engine start, plan for contingency consistent with manufacturer allowed procedures.
  - While taxiing, plan for contingency and utilize any means at your disposal should the situation arise?

Emergency Procedures – FLIGHT

Special Emergency (Air Piracy) - Aeronautical Information Manual /Chapter 6-3-4

a. A special emergency is a condition of air piracy, or other hostile act by a person(s) aboard an aircraft, which threatens the safety of the aircraft or its passengers.

b. The pilot of an aircraft reporting a special emergency condition should:

  1. If circumstances permit, apply distress or urgency radiotelephony procedures. Include the details of the special emergency.
REFERENCE:
AIM, Distress and Urgency Communications, Paragraph 6-3.1.

2. If circumstances do not permit the use of prescribed distress or urgency procedures, transmit:

   (a) On the air/ground frequency in use at the time.

   (b) As many as possible of the following elements spoken distinctly and in the following order:

       (1) Name of the station addressed (time and circumstances permitting).

       (2) The identification of the aircraft and present position.

       (3) The nature of the special emergency condition and pilot intentions (circumstances permitting).

       (4) If unable to provide this information, use code words and/or transponder as follows:


<table>
<thead>
<tr>
<th>Spoken Words</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRANSPONDER SEVEN FIVE ZERO ZERO</td>
<td>I am being hijacked/forced to a new destination</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transponder Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode 3/A, Code 7500</td>
</tr>
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</table>

NOTE-
Code 7500 will never be assigned by ATC without prior notification from the pilot that the aircraft is being subjected to unlawful interference. The pilot should refuse the assignment of Code 7500 in any other situation and inform the controller accordingly. Code 7500 will trigger the special emergency indicator in all radar ATC facilities.

c. Air traffic controllers will acknowledge and confirm receipt of transponder Code 7500 by asking the pilot to verify it. If the aircraft is not being subjected to unlawful interference, the pilot should respond to the query by broadcasting in the clear that the aircraft is not being subjected to unlawful interference. Upon receipt of this information, the controller will request the pilot to verify the code selection depicted in the code selector windows in the transponder control panel and change the code to the appropriate setting. If the pilot replies in the affirmative or does not reply, the controller will not ask further questions but will flight follow, respond to pilot requests and notify appropriate authorities.

d. If it is possible to do so without jeopardizing the safety of the flight, the pilot of a hijacked passenger aircraft, after departing from the cleared routing over which the aircraft was operating, will attempt to do one or more of the following things, insofar as circumstances may permit:

   1. Maintain a true airspeed of no more than 400 knots, and preferably an altitude of between 10,000 and 25,000 feet.

   2. Fly a course toward the destination which the hijacker has announced.
e. If these procedures result in either radio contact or air intercept, the pilot will attempt to comply with any instructions received which may direct the aircraft to an appropriate landing field.

- **Obtaining Emergency Assistance**
  - A pilot in distress or urgency condition should immediately take the following action, not necessarily in the order listed, to obtain assistance:
    - Climb, if possible and only in compliance with ATC clearances, for improved communications, and better radar and direction finding detection. However, it must be understood that unauthorized climb or descent under IFR conditions within controlled airspace is prohibited, except as permitted by 14 CFR Section 91.3(b).
    - If equipped with a radar beacon transponder (civil) or IFF/SIF (military):
      - Continue squawking assigned Mode A/3 discrete code/VFR code and Mode C altitude encoding when in radio contact with an air traffic facility or other agency providing air traffic services, unless instructed to do otherwise.
      - If unable to immediately establish communications with an air traffic facility/agency, squawk Mode A/3, Code 7700/Emergency and Mode C.
    - Transmit a distress or urgency message consisting of as many as necessary of the following elements, preferably in the order listed:
      - If distress, MAYDAY, MAYDAY, MAYDAY; If urgency, PAN-PAN, PAN-PAN, PAN-PAN.
      - Name of station addressed.
      - Aircraft identification and type.
      - Nature of distress or urgency.
      - Weather.
      - Pilot’s intentions and request.
      - Present position and heading; or if lost, last known position, time and heading since that position.
      - Altitude or flight level.
      - Fuel remaining in minutes.
      - Number of people aboard.
      - Any other useful information.
  - After establishing radio contact, comply with advice and instructions received. Cooperate. Do not hesitate to ask questions to clarify instructions when you do not understand or if you cannot comply with clearance. Assist the ground station to control communications on the frequency in use. Silence interfering radio stations. Do not change frequency or change to another ground station unless absolutely necessary. If you do, advise the ground station of the new frequency and station name prior to the change, transmitting in the blind if necessary. If two-way communications cannot be established on the new frequency, return immediately to the frequency or station where two-way communications last existed.
  - When in a distress condition with crash landing or ditching imminent, take the following additional actions to assist search and rescue units:
    - Time and circumstances permitting, transmit as many as necessary of the above elements, and any of the following that you think might be helpful:
      - ELT status.
• Visible landmarks.
• Aircraft color.
• Emergency equipment on board
  ▪ Activate your ELT if the installation permits.
  ▪ For crash landing or ditching if risk of fire is not a consideration set your radio for continuous transmission.
  ▪ If it becomes necessary to ditch, make every effort to ditch near a surface vessel. If time permits, a FAA facility should be able to get the position of the nearest commercial or Coast Guard vessel from a Coast Guard Rescue Coordination Center.
• After a crash landing, unless you have good reason to believe that search aircraft or ground teams will not locate you, it is best to remain with your aircraft and prepare means for signaling search aircraft.

• Diversion considerations
  o Under any circumstances, when a diversion is necessary, the primary consideration must be the safety and security of the flight. Once the safety and security of the flight is in hand, accommodations and back-up transportation for passengers and crew should be considered.

Disqualifying Offenses
49 CFR 1544.229-Fingerprint based Criminal History Records Check
(d) Disqualifying criminal offenses. An individual has a disqualifying criminal offense if the individual has been convicted, or found not guilty by reason of insanity, of any of the disqualifying crimes listed in this paragraph in any jurisdiction during the 10 years before the date of the individual's application for authority to perform covered functions, or while the individual has authority to perform covered functions. The disqualifying criminal offenses are as follows:

5. Interference with flight crew members or flight attendants; 49 U.S.C. 46504.
7. Carrying a weapon or explosive aboard aircraft; 49 U.S.C. 46505.
11. Unlawful entry into an aircraft or airport area that serves air carriers or foreign air carriers contrary to established security requirements; 49 U.S.C. 46314.
14. Assault with intent to murder.
15. Espionage.
17. Kidnapping or hostage taking.
18. Treason.
19. Rape or aggravated sexual abuse.
20. Unlawful possession, use, sale, distribution, or manufacture of an explosive or weapon.
22. Armed or felony unarmed robbery.
23. Distribution of, or intent to distribute, a controlled substance.
25. Felony involving a threat.
26. Felony involving –
   (i) Willful destruction of property;
   (ii) Importation or manufacture of a controlled substance;
   (iii) Burglary;
   (iv) Theft;
   (v) Dishonesty, fraud, or misrepresentation;
   (vi) Possession or distribution of stolen property;
   (vii) Aggravated assault;
   (viii) Bribery; or
   (ix) Illegal possession of a controlled substance punishable by a maximum term of imprisonment of more than 1 year.
28. Conspiracy or attempt to commit any of the criminal acts listed in this paragraph (d).
GLOSSARY OF TERMS

**Aircraft operator:** A person or entity having operational control of an aircraft, including each person holding a qualified minimum fractional ownership interest therein; more particularly, the person having operational control of a registered aircraft.

**Airport Operator:** Unless context otherwise requires, a person operating an airport subject to security program requirements approved by TSA under provision of 49 CFR 1542.

**Air operations area (AOA):** A portion of an airport, specified in the airport security program, in which security measures specified in this part are carried out. This area includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas, for use by aircraft regulated under 49 CFR part 1544 or 1546, and any adjacent areas (such as general aviation areas) that are not separated by adequate security systems, measures, or procedures. This area does not include the secured area.

**Airport Security Coordinator (ASC):** A person serving as the principal point of contact for security matters at a part 1542 airport.

**CFR:** Code of Federal Regulations (i.e. FAR & TSR)

**Crewmember:** A person transported in an aircraft, other than a passenger, including but not limited to a pilot, flight engineer, or flight attendant.

**Criminal History Records Check (CHRC):** An investigation initiated by the submission of fingerprints to one or more law enforcement agencies, including the Federal Bureau of Investigation and United States Secret Service, for purposes of determining an individual’s security reliability; results indicating a conviction or finding of not guilty by reason of insanity with respect to one or more disqualifying offenses (see 49 CFR 1550.37 (h)) render the subject of the investigation ineligible for service in a position of trust.

**Fixed Base Operator (FBO):** A person or entity providing aircraft services at an airport; when so approved by TSA, a person providing civil aviation security inspection and screening services for hire.

**Escort:** To accompany or monitor the activities of an individual who does not have unescorted access authority into or with a secured area or IDA.

**FAA:** Federal Aviation Administration.

**Known passenger:** Personnel that travel on board the company aircraft, engaged in a known itinerary and recognized by the Pilot-In-Command through sight or independent validation/verification.

**Registered Aircraft:** An aircraft, the type, model, registration number and base of operations, of which has been recorded with TSA by an aircraft operator.

**Sensitive Security Information:** Information controlled under the provisions of 49 CFR 1520, which may be communicated by, between and among persons on an operational “need-to-know” basis, only.

**Security Champion:** The flight department personnel tasked with the overall responsibility for the implementation of the Flight Department Security Program. The Security Champion reports directly to the Flight Department Manager (or equivalent) on all security issues and shall also serve all levels of the department as an advisor on security matters. May act as Security Coordinator.

**Security Coordinator:** An individual designated by an Aircraft Operator to act as the primary point of contact for security-related activities and communications with the TSA.

**Secured area:** An airport area, specified in the airport security program, in which security measures are carried out in accordance with 49 DFR 1542, 1544 or 1546; a restricted area in which persons who have not been granted unescorted access privileges by the Airport Operator must be under continuous supervision by persons having unescorted access privileges.

**Security Identification Display Area (SIDA):** An airport area, specified in the airport security program, in which persons who have been granted unescorted access privileges by the Airport Operator must
continuously display airport identification media in accordance with 49 CFR 1542, 1544 or 1546; a restricted access area.

Sterile area: An airport terminal area in which explosives, incendiaries and weapons are generally prohibited, and requiring inspection of one’s person and accessible property as a condition of entry; a terminal controlled access area communicating with an AOA or secured area, and generally used by passengers waiting to board aircraft.

TSA: Transportation Security Administration.

Transportation Security Regulations (TSR): The regulations issued by the Transportation Security Administration, in title 49 of the Code of Federal Regulations, chapter XII, which includes parts 1500 through 1699.

Unescorted access authority: The authority granted by an airport operator, an aircraft operator, foreign air carrier, or airport tenant under part 1542, 1544, or 1546 of this chapter, to individuals to gain entry to, and be present without an escort in, secured areas and SIDA's of airports.
Appendix A - IS-BAO Supplement – 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.


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/ 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. 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](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](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](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.
Appendix B - IS-BAO Registration Application

Operators applying for IS-BAO registration are requested to complete this form in full and submit it to IBAC. The IS-BAO Accredited Auditor who completed the registration audit will submit a copy of the audit report to IBAC for review. This review will be completed prior to processing of the Certificate of Registration.

Operator Name: ____________________________________________________________
Address: ________________________________________________________________
Contact Person: ____________________________________________________________
Telephone Number: __________________________ Fax Number: ____________________
E-mail Address: ____________________________________________________________
Signature: □

Association from which the IS-BAO was purchased: ______________________________

Auditor Name: __________________________ Auditor company: _______________________
Address: ________________________________________________________________
Telephone Number and E-mail Address: __________________________________________

Enclosed Are:
   or, Completed VISA or Master Card charge authorization (see below) □
2. A copy of the Operator logo to be included on the Registration Certificate. (Optional. It may be submitted in electronic or hard copy.) □
A list of IS-BAO Registered operators is posted on the IBAC web site. If your organization does not wish to be included in this list please indicate NO in the space to the right. □
If you are a commercial air service provider and wish to have your web site URL included with your listing, please enter it here: __________________________

For payment by Visa or Master Card
Type of Card: Visa □ Master Card □
Name on Card: ____________________________________________________________
Card Number/Expiry Date: ____________________________ Exp ______ / ______
Signature: □

Submit to:
International Business Aviation Council (IBAC) Phone 1-514-954-6198
Suite 16.33, 999 University Street Fax 1-514-954-6161
Montreal, Quebec e-mail administration@ibac.org
H3C 5J9, Canada
Appendix C - IS-BAO Registration Renewal Form

Operators renewing their IS-BAO registration are requested to complete this form in full and submit it to IBAC. The IS-BAO Accredited Auditor who completed the registration audit will submit a copy of the audit report to IBAC for review. This review will be completed prior to processing of the Certificate of Registration.

<table>
<thead>
<tr>
<th>Operator Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Contact Person:</td>
<td></td>
</tr>
<tr>
<td>Telephone Number:</td>
<td></td>
</tr>
<tr>
<td>Fax Number:</td>
<td></td>
</tr>
<tr>
<td>E-mail Address:</td>
<td></td>
</tr>
<tr>
<td>Expiry Date of current IS-BAO Registration:</td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

| Auditor Name |  |
| Auditor company |  |
| Address: |  |
| Telephone Number |  |
| and E-Mail Address: |  |

Enclosed Are:

   or, Completed VISA or Master Card charge authorization (see below)
2. A copy of the Operator logo if it has been changed or updated from previous certificate. (please send print quality elect. file)

A list of IS-BAO Registered operators is posted on the IBAC web site. If your organization does not wish to be included in this list please indicate NO in the space to the right.

If you are a commercial air service provider and wish to have your web site URL included with your listing, please enter it here:

For payment by Visa or Master Card

<table>
<thead>
<tr>
<th>Type of Card</th>
<th>Visa</th>
<th>Master Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name on Card:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Card Number/Expiry Date:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Submit to:

International Business Aviation Council (IBAC)  Phone: 1-514-954-6198
Suite 16.33, 999 University Street  Fax: 1-514-954-6161
Montreal, Quebec  e-mail: administration@ibac.org
H3C 5J9, Canada
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACAS</td>
<td>Airborne Collision Avoidance System</td>
</tr>
<tr>
<td>AIP</td>
<td>Aeronautical Information Publication</td>
</tr>
<tr>
<td>AMO</td>
<td>Approved Maintenance Organisation</td>
</tr>
<tr>
<td>ANS</td>
<td>Air Navigation System</td>
</tr>
<tr>
<td>ATC</td>
<td>Air Traffic Control</td>
</tr>
<tr>
<td>ATPL</td>
<td>Airline Transport Pilot Licence</td>
</tr>
<tr>
<td>ATS</td>
<td>Air Traffic Services</td>
</tr>
<tr>
<td>BBGA</td>
<td>British Business and General Aviation Association</td>
</tr>
<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>
</tr>
<tr>
<td>CAM</td>
<td>Continuing Airworthiness Manager</td>
</tr>
<tr>
<td>CAMO</td>
<td>Continuing Airworthiness Management Organisation</td>
</tr>
<tr>
<td>CAME</td>
<td>Continuing Airworthiness Management Exposition</td>
</tr>
<tr>
<td>CAT II and III</td>
<td>Category II and III. Limits associated with a precision instrument approach system.</td>
</tr>
<tr>
<td>CDI</td>
<td>Course Deviation Indicator</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>C of A</td>
<td>Certificate of Airworthiness</td>
</tr>
<tr>
<td>C of R</td>
<td>Certificate of Registration</td>
</tr>
<tr>
<td>CRM</td>
<td>Crew Resource Management</td>
</tr>
<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>
</tr>
<tr>
<td>EGPWS</td>
<td>Enhanced Ground Proximity Warning System</td>
</tr>
<tr>
<td>ELT</td>
<td>Emergency Locator Transmitter</td>
</tr>
<tr>
<td>ERS</td>
<td>Emergency Response Services</td>
</tr>
<tr>
<td>FAA</td>
<td>Federal Aviation Administration of the USA</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>FATO</td>
<td>Final Approach and Take-off Area</td>
</tr>
<tr>
<td>FIR</td>
<td>Flight Information Region</td>
</tr>
<tr>
<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>
</tr>
<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>
</tr>
<tr>
<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>
</tr>
<tr>
<td>FMS</td>
<td>Flight Management System</td>
</tr>
<tr>
<td>GM</td>
<td>Guidance material on meeting the requirements of a standard.</td>
</tr>
<tr>
<td>GPWS</td>
<td>Ground Proximity Warning System</td>
</tr>
<tr>
<td>HAI</td>
<td>Helicopter Association International</td>
</tr>
<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>
</tbody>
</table>
| Heliport     | 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.  

*Note: Helicopters may be operated to and from areas other than heliports.*

<table>
<thead>
<tr>
<th>Hostile environment</th>
<th>An environment in which:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate; or</td>
</tr>
<tr>
<td>b.</td>
<td>the helicopter occupants cannot be adequately protected from the elements; or</td>
</tr>
<tr>
<td>c.</td>
<td>search and rescue response/capability is not provided consistent with anticipated exposure; or</td>
</tr>
<tr>
<td>d.</td>
<td>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>Abbreviation</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>
</tbody>
</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>
</tr>
</thead>
<tbody>
<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>
</tr>
</tbody>
</table>