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Doc 10084

Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones

Third Edition, 2023



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XXXXXXXXXXXXXXXXXXXX Manual for Civil Aircraft
تعريفات المطارات وخدمات الملاحة الجوية
XXXXXXXXXXXX Operations Over or Near Conflict Zones

Volume X — XXXXXXXX
Third Edition, 2023
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AMENDMENTS

Amendments are announced in the supplements to the *Products and Services Catalogue*; the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

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HISTORY AND RELATED WORK IN PROGRESS

In response to the downing of Malaysia Airlines flight 17 (MH17) on 17 July 2014, the International Civil Aviation Organization (ICAO), Airports Council International (ACI), the Civil Air Navigation Services Organisation (CANSO) and the International Air Transport Association (IATA) issued a joint statement¹ on 29 July 2014 expressing strong condemnation of the use of weapons against a civil aircraft, and support for establishing a senior-level task force to address issues related to the safety and security of civil aircraft in airspace flying over or near conflict zones.

In 2014, ICAO established the Task Force on Risks to Civil Aviation arising from Conflict Zones (TF RCZ), which developed a work programme with twelve objectives, including the establishment of a centralized system that would consolidate the available information related to conflict zones. The Conflict Zone Information Repository (CZIR), a tool to disseminate information related to risks to civil aviation arising from conflict zones, was launched in 2015.

The first edition of this document, initially drafted under the title *Civil Aircraft Operations Over Conflict Zones* (Restricted), was published in November 2016 and reissued in April 2017 as Doc 10084 (Restricted).

On 13 October 2015, the Dutch Safety Board published the MH17 Final Report of the accident investigation with safety recommendations to ICAO, IATA, ICAO Member States and operators.

During its 209th Session, the ICAO Council noted that there had been significant progress on the part of States and industry in developing systems, separate from the CZIR, to share information concerning risks associated with operations over or near conflict zones. In considering these developments and noting the decline in the number of postings in the CZIR, the ICAO Council requested a comprehensive study be undertaken on the availability of tools and mechanisms developed by external entities to share risk-based information. As part of the study, ICAO, in partnership with CANSO, IATA and the International Business Aviation Council (IBAC), launched a survey to determine the availability and adequacy of information related to risks to civil aviation provided by entities external to ICAO. The survey was held from December 2016 to January 2017.

The analysis of replies provided by aircraft operators and air navigation services providers (ANSPs) revealed that the appropriate information on risks to civil aviation was effectively being made available outside of the CZIR by both States and industry. The study also recognized a significant decline in the number of States making their information related to risks to civil aviation over or near conflict zones available on the CZIR and showed that such information was mostly disseminated through Notices to Airmen (NOTAMs), Aeronautical Information Circulars (AIC) and aeronautical information publication (AIP) supplements. However, the responders to the enquiry revealed a desire to standardize the format in which risk information was made available and to develop solutions allowing for timely and automated access to such information.

¹ Joint Statement on Risks to Civil Aviation Arising from Conflict Zones: <https://www.icao.int/Newsroom/Pages/Joint-Statement-on-Risks-to-Civil-Aviation-Arising-from-Conflict-Zones.aspx>

Considering the results of the survey and the decline in the number of postings in the CZIR, ICAO noted that the CZIR had ceased to function as a means to gather and disseminate specific risk-based information concerning operations over or near conflict zones, and a decision was made to discontinue the CZIR and to transition the CZIR into a library of links on the ICAO public website to States' own aeronautical information related to risks to civil aircraft operations over or near conflict zones.

In November 2017, ICAO decided to discontinue the ICAO web-library of risk-based information and to devote increasing efforts to provide training and capacity-building initiatives in order to assist States to further develop their risk management capabilities as well as multilateral arrangements for the sharing of risk information.

Doc 10084 was further amended in the second edition to expand the advice for States and operators regarding the risks from surface-to-air missiles (SAMs) and key risk factors to be considered for their own risk assessments. The second edition of Doc 10084 was published in 2018 under the new name *Risk Assessment Manual for Civil Aircraft Operations over or near Conflict Zones*, in line with its revised content. The enhanced guidance material in the manual is based on existing ICAO provisions and industry practices related to:

- a) responsibilities of States, operators and other service providers within States;
- b) significant regulatory developments and existing practices since 2014;
- c) consolidated source material for conducting risk assessments;
- d) outline of risk information sharing mechanisms;
- e) guidance to States and operators on what to do with threat and risk information; and
- f) existing mechanisms for State-to-operator and/or State-to-State sharing of information.

In order to make the guidance material in the second and future editions of Doc 10084 more accessible for States, aircraft operators, ANSPs, and other entities concerned, and considering that the revised material does not contain any sensitive security information, ICAO amended the document's classification from restricted to non-restricted.

In response to the downing of Ukraine International Airlines flight 752 (PS752) on 8 January 2020, Canada established the Safer Skies Initiative, whose objective is to improve the safety and security of air travel worldwide by addressing gaps in the way the civil aviation sector deals with conflict zones.

ICAO welcomed the Safer Skies Initiative and initiated a comprehensive gap analysis of current airspace management and conflict zone Standards and Recommended Practices (SARPs) as well as related guidance material, vis-à-vis work completed post-MH17.

In 2021, ICAO concluded its gap analysis highlighting the progress of current airspace management and conflict zone SARPs as well as related guidance material, which included:

- a) the applicability of relevant amendments of Annex 6, Annex 11 and Annex 15 on 5 November 2020;
- b) the publication of the first edition of the *Manual on Civil-Military Cooperation in Air Traffic Management* (Doc 10088) in January 2021; and
- c) the ongoing work on the *Manual Concerning Safety Measures Relating to Military Activities Potentially Hazardous to Civil Aircraft Operations* (Doc 9554).

On 24 June 2021, the Dutch Safety Board published its final report titled *Safe flight routes - Responses to escalating conflicts*. This report synthesizes the findings of the Dutch Safety Board's previous MH17 investigations (one in 2015 and a follow-up investigation of the safety recommendations in 2019), and is complemented with new findings on the current practice of airspace management, information sharing and decision-making in the context of flying over or near conflict zones. The report contains two international safety recommendations: addressing the development and application of risk assessment methods based on the precautionary principle for civil aviation operations over or near conflict zones and developing guiding principles related to airspace closure.

In parallel to these efforts, several global and regional initiatives were established, strengthening baseline and rapid information sharing practices within the civil aviation community, enhancing effective airspace risk management (including harmonizing airspace notification language), creating a mitigation strategy inventory, developing guiding principles related to airspace closure, and exploring the precautionary approach.

The third edition of Doc 10084 follows the outcome² of the 41st Session of the ICAO Assembly in 2022, which supported the proposal to prioritize the review of Doc 10084, taking into consideration the work conducted by international and regional groups and organizations.

² Report of the Executive Commission, paragraph 28.29

GLOSSARY

When the following terms are used in this manual, they have the following meanings:

Acceptable level of safety performance (ALoSP). The level of safety performance agreed by State authorities to be achieved for the civil aviation system in a State, as defined in its State safety programme (SSP), expressed in terms of safety performance targets and safety performance indicators.

Note.— An acceptable level of safety performance for the State can be demonstrated through the implementation and maintenance of the SSP as well as safety performance indicators and safety performance targets showing that safety is effectively managed, built on the foundation of implementation of existing safety-related SARPs.

Acts of unlawful interference. These are acts or attempted acts such as to jeopardize the safety of civil aviation, including but not limited to:

- unlawful seizure of aircraft;
- destruction of an aircraft in service;
- hostage-taking on board aircraft or on aerodromes;
- forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility;
- introduction on board an aircraft or at an airport of a weapon or hazardous device or material intended for criminal purposes;
- use of an aircraft in service for the purpose of causing death, serious bodily injury or serious damage to property or the environment; and
- communication of false information such as to jeopardize the safety of an aircraft in flight or on the ground, passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility.

(Aircraft) Operator. In the context of this document, references to the (aircraft) operator refer to operators subject to ICAO Annex 6 — *Operation of Aircraft*, Parts I, II and III, being operators of aeroplanes or helicopters authorized to conduct international commercial air transport operations or involved in international general aviation.

Air navigation services. This term includes air traffic management (ATM), communications, navigation and surveillance systems (CNS), meteorological services for air navigation (MET), search and rescue (SAR) and aeronautical information services/aeronautical information management (AIS/AIM). These services are provided to air traffic during all phases of operations (approach, aerodrome and en route).

Air navigation services provider (ANSP). Any entity providing ATM and/or other air navigation services mentioned in the definition for *Air navigation services*.

Note.— Annex 17 uses the term Air traffic service provider (ATSP). ATSP should be considered synonymous with ANSP as used in this manual.

Air-to-air missiles. Missiles fired at an aircraft from another aircraft.

Appropriate ATS authority. The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

Appropriate authority for aviation security. The authority designated by a State within its administration to be responsible for the development, implementation and maintenance of the national civil aviation security programme.

Aviation Security. Safeguarding civil aviation against acts of unlawful interference. This objective is achieved through a combination of measures and human and material resources.

Civil aircraft. Non-State aircraft (pursuant to Article 3 of the Chicago Convention). This could include passenger airliners, cargo aircraft, and business or private jets.

Conflict zones. Areas where conflict is occurring or is likely to occur between militarized parties, which may include both State and non-State actors. It also includes areas where such parties are in a heightened state of tensions.

Contingency plan. A proactive plan to include measures and procedures addressing various threat levels, risk assessments and the associated security measures to be implemented, designed to anticipate and mitigate events as well as prepare all concerned parties having roles and responsibilities in the event of an actual act of unlawful interference. A contingency plan sets forth incremental safety, efficiency and security measures that may be elevated as the threat increases. It may be a stand-alone plan or included as part of a Crisis Management Plan.

Hazard. A condition or an object with the potential to cause or contribute to an aircraft incident or accident.

Man-Portable Air Defence Systems (MANPADS). Shoulder-launched surface-to-air missile weapon systems. These have the capability of reaching aircraft from the ground to altitudes in excess of 25 000 ft (7 600 m) above ground level (AGL).

Non-State actors. Individuals, groups of individuals or organizations that are not under the control of, nor report to, a State.

NOTAM. A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

Overflying. Passing over terrestrial areas (land or sea) at cruising altitude.

Risk index matrix. A matrix that is used during safety risk assessment to define the level of risk by considering the category of probability or likelihood against the category of consequence severity. This is a simple mechanism to increase visibility of risks and assist management decision-making.

Risk level. See **Acceptable level of safety performance (ALoSP)**.

Risk mitigation. The process of incorporating additional measures to lower the vulnerability to a specific scenario.

Safety. The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.

Safety risk. The predicted probability and severity of the consequences or outcomes of a hazard.

Security risk. Identification of the level of exposure to a successful attack being carried out on a specific target, taking into account the assessed threat and consequences, as well as an assessment of the remaining vulnerabilities after evaluating the effectiveness of the aviation security measures currently in place.

Service provider. Any organization providing aviation products and/or services. The term thus encompasses approved training organizations that are exposed to safety risks during the provision of their services, aircraft operators, approved maintenance organizations, organizations responsible for type design and/or manufacture of aircraft, engines or propellers, air navigation services providers and certified aerodromes.

Surface-to-air missiles (SAMs). Advanced military weapon systems, capable of targeting aircraft from the ground up to, and above, cruising level altitudes. MANPADS are a subset of SAMs.

Surface-to-surface missiles (SSMs). Military weapon systems capable of long-range attacks (e.g. ballistic missiles), which can be precision-guided or unguided.

State of the Operator. The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

Threat. The likelihood of a credible attack being attempted, based on the intentions and capabilities of perpetrators but not taking into account current security measures.

Unmanned aircraft (UA). An aircraft intended to be operated with no pilot on board.

Unmanned aircraft system (UAS). An aircraft and its associated elements, which are operated with no pilot on board.

Vulnerability. Factors or attributes that render an entity, asset, system, network or geographic area open to successful exploitation or attack, or susceptible to a given threat or hazard.

ACRONYMS AND ABBREVIATIONS

ACARS	Aircraft communications addressing and reporting system
ACI	Airports Council International
AGL	Above ground level
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
ANSP	Air navigation services provider
ASCB	Aviation Security Coordination Body
ASP	Aviation Security Programme
ATS	Air traffic services
ATM	Air traffic management
AVSEC	Aviation security
CANSO	Civil Air Navigation Services Organisation
CCT	Contingency Coordination Team
CZIB	Conflict Zone Information Bulletin
CZIR	Conflict Zone Information Repository
DfT	Department for Transport (United Kingdom)
Doc	Document
EASA	European Union Aviation Safety Agency
EGRICZ	Expert Group on Risk Information overflying Conflict Zones
EU	European Union
FIR	Flight Information Region
IATA	International Air Transport Association
IBAC	International Business Aviation Council
ICAO	International Civil Aviation Organization
MANPADS	Man-portable air defence systems
MH17	Malaysia Airlines flight 17
NCASP	National Civil Aviation Security Programme
NOTAM	Notice to Airmen
PS752	Ukraine International Airlines flight 752
SAM	Surface-to-air missile
SARPs	Standards and Recommended Practices
SMM	Safety Management Manual
SSCC	Safer Skies Consultative Committee
SSM	Surface-to-surface missile
SSP	State safety programme
TF RCZ	Task Force on Risks to Civil Aviation Arising from Conflict Zones (ICAO)
UAS	Unmanned aircraft system(s)

RELATED ICAO PUBLICATIONS

ANNEXES

Annex 6 — *Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes*
Annex 11 — *Air Traffic Services*
Annex 15 — *Aeronautical Information Services*
Annex 17 — *Aviation Security — Safeguarding International Civil Aviation Against Acts of Unlawful Interference*
Annex 19 — *Safety Management*

GUIDANCE MATERIAL

Doc 4444, *Air Traffic Management (PANS-ATM)*
Doc 8126, *Aeronautical Information Services Manual*
Doc 8973 (Restricted), *Aviation Security Manual*
Doc 9426, *Air Traffic Services Planning Manual*
Doc 9433, *Manual Concerning Interception of Civil Aircraft*
Doc 9554, *Manual Concerning Safety Measures Relating to Military Activities Potentially Hazardous to Civil Aircraft Operations*
Doc 9859, *Safety Management Manual (SMM)*
Doc 9971, *Manual on Collaborative Air Traffic Flow Management (ATFM)*
Doc 9985, *Air Traffic Management Security Manual*
Doc 10088, *Manual on Civil-Military Cooperation in Air Traffic Management*
Doc 10108 (Restricted), *Aviation Security Global Risk Context Statement*
Man-Portable Air Defence Systems (MANPADS) - Information and Airport Vulnerability Assessment Guide

Chapter 1

INTRODUCTION

1.1 PURPOSE AND SCOPE

1.1.1 This manual contains advice to States, aircraft operators (civil and military), air navigation services providers (ANSPs) and other entities deemed appropriate on the subject of risk management for civil aircraft operations over or near conflict zones. It contains consolidated guidance to support implementation of relevant International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs), ICAO guidance material and industry best practices. It covers the risk from both deliberate acts and unintentional hazards to civil aircraft operations over or near conflict zones.

1.1.2 States should issue and/or enable warning of threats and hazards in their sovereign and delegated airspace, including to aircraft operators and ANSPs, and coordinate activities so as to minimize threats and hazards. With the objective of assisting in this, this manual aims to provide guidance to identify the main risk factors that States could take into account.

1.1.3 Ultimately, aircraft operators and ANSPs are the entities responsible for conducting safety risk assessments specific to the geographical location, type and extent of their operations. Assessments should be an integral part of the risk management process implemented by these entities.

1.1.4 The manual focuses primarily on the risk posed by long-range surface-to-air missiles (SAMs) as these are currently considered to pose the most significant risk to civil aircraft operating over or near conflict zones. The manual does not cover the risk that arises at lower altitudes (including during take-off and landing phases) from shorter-range SAMs such as Man-portable air defence systems (MANPADS), which has been the subject of other assessments.¹ However, some of the considerations and conclusions may be applied to MANPADS that have the capability of reaching aircraft from the ground to altitudes in excess of 25 000 ft (7 600 m) above ground level (AGL) and would also apply to air-to-air missiles launched from manned or unmanned aircraft.

1.1.5 The decision as to whether a civil aircraft will be flown over or near conflict zones is the responsibility of the various parties involved, i.e. the State(s) (and regional civil aviation authority or authorities if applicable) where the conflict zone is located and their ANSPs, the State of the Operator, the aircraft operator, and other relevant stakeholders. This manual describes the roles, responsibilities and/or activities of such parties, which are largely based on the applicable provisions contained in Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport — Aeroplanes*, Annex 11 — *Air Traffic Services*, Annex 15 — *Aeronautical Information Services*, Annex 17 — *Aviation Security — Safeguarding International Civil Aviation Against Acts of Unlawful Interference* and Annex 19 — *Safety Management*, as well as related guidance material (Docs 8126, 8973 (Restricted), 9426, 9433, 9554, 9859, 9985, 10088, and 10108 (Restricted)). The manual also describes the risk management processes, including risk assessment and mitigation, such as conducting closure and reassessment of conflict zone airspace to safeguard civil aviation operations over or near conflict zones. It provides best practice examples drawn from States and industry.

1. *Aviation Security Global Risk Context Statement* (Doc 10108 – Restricted), Third Edition, September 2022; and *Man-Portable Air Defence Systems (MANPADS) - Information and Airport Vulnerability Assessment Guide* (Restricted), First Edition, July 2015.

1.1.6 When introducing restrictions for aircraft operators to fly over or near conflict zones, States should take into consideration that any aircraft may, at any moment in time, need to divert from the air traffic control clearance and/or dedicated flight profile if an emergency occurs, which may lead to a diversion or forced landing in a conflict zone or overflying closed airspace.

1.1.7 When introducing restrictions, States should also take into consideration the potential range of different types of ground and air-based weapons used during armed conflict or military exercises.

RISKS TO CIVIL AIRCRAFT FROM OPERATIONS OVER OR NEAR CONFLICT ZONES

2.1.1 The principal weapons of concern for these purposes are SAMs with the capability of reaching aircraft at flight cruising altitudes. These are large and complex pieces of defensive equipment, which are designed to be operated by military personnel. There are many different types of SAMs, with varying capabilities and technologies, that are designed to identify, track and destroy airborne threats. Civil aircraft represent highly vulnerable targets due to their size and predictable flight paths and are generally not equipped to detect SAM threats, nor are they capable of responding to being fired upon by a SAM.

2.1.3 Given the wide proliferation of weapon systems, some non-State actors will very likely have obtained SAMs, either indirectly by sponsoring States, or through the seizure of former State assets during or following conflict situations. In either case, the risk to civil aviation increases when these weapon systems are operated by non-State actors, given that these actors might lack access to formal military training on target identification and airspace deconfliction, and do not have information about civilian air traffic for an affected area.

2.2.1 SAM attacks on civilian aircraft are rare and generally have been inadvertent or accidental events. To date, there have been no documented cases of an intentional SAM attack to deliberately shoot down a civilian aircraft. There have been four documented occurrences¹ where the destruction of civilian aircraft has been attributed to SAM engagements (other than MANPADS). In three of the documented cases, it is likely the event was unintentional, as the target was probably mistakenly identified as a military or an unmanned aircraft. According to open-source data reports, three of the known events occurred during periods of military conflict or high tension; the fourth event appears to have occurred during a military training exercise.

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2.3 THE RISK OF AN ATTACK

2.3.1 Some non-State actors have publicly stated that they have a continuing and active interest in attacking civil aviation. Aircraft are seen as iconic targets whose destruction could have a major impact, not only through the loss of life, but also in terms of economic consequences, publicity, political reaction and loss of public confidence in the aviation sector. In general, non-State actors (as opposed to militarized forces) may not have access to long-range SAMs (as distinct from MANPADS). However, in making this assessment it is important to stress that:

- a) there is a high level of intent among some of these actors to attack aviation should the opportunity arise;
- b) although some of these actors may have sufficient resources to acquire SAMs — they would find it difficult to do so without sponsorship and training by States;
- c) future weapon advancements and proliferation through State sponsorship may result in long-range SAM and/or air-to-air missile capabilities becoming accessible to non-State actors;
- d) this position could change rapidly given the fluidity of current political and military events in some regions; and
- e) this assessment is based on the information available and may not be complete.

2.3.2 Non-State actors tend to operate more freely in conflict zones where there is a breakdown of State control. If these actors succeed in acquiring SAMs, and the capability to operate them, the vulnerability of aircraft operating in airspace over or near those areas would be high. With regard to States and non-State actors that currently have access to SAMs, there is no reason to believe that the intent is to target civil aviation deliberately. However, the last two caveats in 2.3.1 also apply here.

2.3.3 The overall risk to civil aviation from an attack in conflict zones is assessed by ICAO² as medium-high, which is the fourth step in a five-point scale. Even so, the situation in these zones can be subject to unpredictable changes, which could rapidly and significantly increase the level of risk. Ongoing monitoring of conflict zones is therefore the best way to continually assess and mitigate those risks. Possible mitigations for this risk would include:

- a) counter-proliferation measures;
- b) avoidance of airspace within range of a possible attack;³
- c) ensuring air traffic services (ATS) authorities do not issue air traffic control clearances to aircraft into airspace that could be hazardous due to a planned or potential short or no-notice change of activity within the airspace of a conflict zone;
- d) closing all or part of the controlled airspace and/or aerodrome(s) within conflict zones. Chapter 5 provides guidance how to conduct conflict zone airspace closure; and
- e) improved civil-military coordination, weapon command and control and airspace deconfliction will reduce the inadvertent risk to civil aviation operations.

2. ICAO *Aviation Security Global Risk Context Statement* (Doc 10108 – Restricted), Third Edition, 2022

3. It is noteworthy that the hazardous range may well exceed territorial boundaries and the airspace above it.

2.4 THE RISK OF UNINTENTIONAL IMPACT

2.4.1 In conflict zones, the capability to target aviation assets may be high and widespread, but historically there has been little to no intent by States to target passenger aircraft. Past events suggest there is a higher risk to civil aviation as an unintended target when flying over or near conflict zones, in particular the deliberate firing of a missile that misses its intended target, or based on the misidentification of a civil aircraft. This could also be applied when taking into account the use of missile defence systems by State actors to shoot down ballistic missiles or military grade weaponized unmanned aircraft systems (UAS). Launches of surface-to-surface missiles (SSMs) (regardless of being test or real launches) also need to be taken into consideration as an SSM might impact a civil aircraft on its trajectory towards the intended target. Areas of conflict may also include a State sponsored entity or proxy group armed with anti-aircraft weapons that have limited training and are operating outside the authority of a State or national command, presenting an increased risk of unintentional impact.

2.4.2 There are well established mitigations in place through existing airspace management, surveillance, navigation and communication systems, which, if they are operating correctly, should enable civilian aircraft flying through controlled airspace to be readily identified. Therefore, at the global level, the historical overall rate of occurrence of unintentional impacts is low. However, this risk may vary significantly over time, and from place to place, as a result of events. Higher levels of risk are associated with flying over or near conflict zones.⁴

2.4.3 This guidance attempts to identify the specific factors that seem most likely to be associated with risks of an unintentional SAM, SSM or air-to-air missile impact on a civil aircraft. Risk factors are presented in Appendix A⁵. To support States, aircraft operators and ANSPs in conducting their geographically-specific risk management, possible actions include:

- a) the conduct of risk assessments by States, aircraft operators and/or ANSPs to inform aircraft routing decisions for operating over or near conflict zones or other areas of high tension;
- b) implementation of provisions by ICAO and/or States, guidance, and leveraging of appropriate information (including information about the results of assessments done by others) that would assist in making those risk assessments, or in making routing decisions; and
- c) avoidance by civil aircraft of airspace over or near conflict zones where the risk of unintentional impact is assessed as high.

2.4.4 There is an additional risk of unintentional impacts on civil aviation from SAM tests or training launches conducted by military forces⁶. However, it is understood that large numbers of such launches take place each year without incident. Provided such tests or training launches are conducted in closed airspace, with robust planning, supervision and proper notification to civil aviation entities, the rate of incidents linked to tests or training has been historically low.

2.4.5 State level research and development of emerging capabilities such as hyper glide vehicles and long-range anti-aircraft weapons with increased standoff ranges may result in increased inadvertent risk concerns, resulting in a greater area of airspace affected than by existing military systems.

4. In the case of MANPADS in areas of conflict and proliferation, see the ICAO *Aviation Security Global Risk Context Statement* (Doc 10108 – Restricted) for the assessment of the residual risks.

5. Appendix A does not cover the risk factors for civil aircraft operations associated with missile defence systems, as mentioned in 2.4.1.

6. There is evidence that Siberia Airlines flight 1812 (2001) was hit under these circumstances.

2.5 AIR-TO-AIR ATTACKS

2.5.1 Risk factors (and mitigations) associated with an unintentional impact from air-to-air missiles launched by military aircraft flying over or near conflict zones would be broadly similar to those for SAMs.

2.5.2 Air-to-air attacks could occur when a civilian aircraft is perceived as a potential threat by State authorities. This could be due to the aircraft crew reporting an act of unlawful interference on board (e.g. breach of the cockpit or hijack), or exhibiting suspicious behaviour (e.g. not communicating with Air Traffic Control or deviating from its air traffic control clearance). The risk of successfully commandeering an aircraft for use as a weapon is regularly assessed in the ICAO *Aviation Security Global Risk Context Statement* (Doc 10108 – Restricted). Instances of failed communication occur frequently and are normally resolved successfully by use of standard intervention procedures in accordance with ICAO's *Manual Concerning Interception of Civil Aircraft* (Doc 9433).

2.5.3 Emerging weapons' capabilities, however, will increase the inadvertent risk to civil aviation from air-to-air missiles. Long-range weapons for beyond line-of-sight targeting may increase the risk of potential aircraft misidentification, including by trained military pilots.

2.5.4 The use of military-grade UAS equipped with anti-aircraft weapons is under development by multiple States. There is potential for UAS platforms to be used to intercept aircraft directly or to be equipped with anti-aircraft missiles. The proliferation of these systems to non-State actors will likely increase the risk of flying over or near conflict zones. The threat by non-State actors is likely to be higher due to the lack of training and lack of integration with State or national command and control systems, as well as lack of information about civilian air traffic in the affected area, e.g. applicable Notices to Airmen (NOTAMs) or inbound/outbound civilian flights. ICAO has developed guidance material related to unauthorized UAS operations near airports.⁷

7. Response to Unauthorized UA in the Vicinity of Aerodrome:
<https://www.icao.int/safety/UA/Documents/Response%20to%20Unauthorized%20UA%20in%20the%20Vicinity%20of%20Aerodrome.pdf>

Chapter 3

ROLES OF PARTIES CONCERNED AND PROMULGATION OF INFORMATION

INTRODUCTION

This chapter describes the roles of the various parties involved in the decision-making process related to flying over or near conflict zones, the associated provisions for promulgation of information and current practices. The described parties involved are: the State that manages the airspace, the aircraft operator, the ANSP, the State of the Operator, ICAO, the regional civil aviation authorities and other stakeholders.

ROLES OF THE PARTIES CONCERNED

3.1 THE STATE THAT MANAGES THE AIRSPACE

3.1.1 States play a major role in providing various parties with essential risk information related to the airspace above conflict zones. Annex 17 Standard 3.1.3 requires States to keep under constant review the level and nature of threats to civil aviation within their territory and the airspace above it, and adjust their security programmes accordingly, based upon a security risk assessment. This review should include delegated airspace. National authorities, including intelligence agencies, should address risks arising from conflict zones and support the State's contribution to the sharing of threat information.

3.1.2 Annex 17 Standard 2.4.4 requires States to establish and implement procedures to share with other States, in a timely manner, threat information that applies to the aviation security interests of those States, to the extent practicable. Annex 17 Standard 3.1.5 also requires States to establish and implement procedures to share, as appropriate, with relevant airport operators, aircraft operators, air traffic services providers or other entities concerned, in a practical and timely manner, relevant information to assist them to conduct effective security risk assessments relating to their operations. Appendix C includes examples of guidance provided by States in the risk assessment process. Appendix D provides examples of how information is shared for exchange and promulgated.

3.1.3 States have exclusive sovereignty over their airspace. This provides States with the authority to enforce a requirement for overflights to be conducted in accordance with their guidance/authorization. Each State also has the authority to prohibit or restrict the use of airspace over its sovereign territory and/or delegated airspace, for reasons of military necessity or public safety, but no State can compel another State to do so.

3.1.4 Based on the information available, the State(s) responsible for providing ATS over a geographical area should identify the area impacted by a conflict zone, assess the hazards/threats or potential hazards/threats to international civil aircraft operations, and determine whether such operations in or through the area of conflict should be avoided or may be continued under specified conditions.

3.1.5 According to Annex 11, the responsibility for instituting special measures, such as contingency plans, to ensure the safety of international civil aircraft operations remains with the State(s) responsible for providing ATS in the airspace affected by the conflict, including delegated airspace, even in cases where coordination with military authorities is not initiated or completed.

3.1.6 In the event of armed conflict or the potential for armed conflict, States whose military forces are engaged in the conflict must initiate the coordination process with ATS. If the necessary information and/or the development of contingency planning is not forthcoming from the States whose authorities are engaged in the armed conflict, other State(s) in the region or those with international flight operations should ascertain the nature and scope of the hazards or potential hazards from other sources, such as aircraft operators, associations of the civil airline industry, airline pilots, civil air navigation services providers, air traffic controllers, adjacent or other States with additional information, or in some cases the relevant ICAO Regional Office in order to support the conduct of a risk assessment, if required.

3.1.7 The need for any safety and security measures will depend on the results of the risk assessment conducted by the State(s) responsible for providing ATS. Flight operations by civil aircraft through the airspace should only be allowed to continue if the risks can be mitigated to an acceptable level (refer to Chapter 5 for guidance on how to conduct conflict zone airspace closure).

3.1.8 The State authority should, when establishing airspace restrictions due to a known or probable threat, request the support of the appropriate military authority and/or any other relevant authority in performing the risk assessment. To ensure effective implementation of those restrictions, a State should establish a joint high-level policy body that will be responsible for oversight, implementation and application of collaborative air traffic management. The high-level body should also have responsibility for continually monitoring the output of national collaborative processes to ensure that both civil and military needs are considered. It should also collaborate with other adjacent or affected States.

3.1.9 If appropriate, and depending on the duration of the conditions, an international Aeronautical Information Publication (AIP) supplement, NOTAM, or Aeronautical Information Circular (AIC), containing the necessary information, advice and safety measures to be taken into account, should then be issued and subsequently updated in light of developments. All those concerned with initiating and issuing a NOTAM should be aware of the provisions governing the duration of the published NOTAM in Annex 15. The promulgation of information is further addressed in 3.7.

3.1.10 Upon the request of an aircraft operator, and if operations are being permitted, the appropriate authority of the State where the conflict zone is located could consider providing real time reports of the situation of the concerned airspace and the destination airport. This information could also include recommendations on how to carry out operations, safety/security advice for crews while on the ground, and any other relevant information for the safe execution of the civil aviation operation while within the conflict zone.

3.1.11 If civil aircraft operations through the area are allowed, immediate attention should be given by the States concerned to special arrangements regarding:

- a) coordination between military authorities, security authorities and ATS units;
- b) briefings of personnel;
- c) identification of civil aircraft by military units;
- d) issuance of warnings and navigational advice; and
- e) air traffic restrictions.

3.2 AIRCRAFT OPERATOR

3.2.1 Annex 6 requires aircraft operators to ensure that flights over or near conflict zones will not commence unless risk assessments have been carried out and appropriate mitigation actions are taken to ensure the safety and security of the aircraft on the intended route. The risk assessments should consider the routeing(s) from the aerodrome of departure to the aerodrome of arrival, as well as the intended take-off, destination and en-route alternate aerodromes. This includes assessing the airspace over or near areas where there is armed conflict posing a risk to civil aviation. In planning the conduct of operations through areas of armed conflict, or with the potential for armed conflict, operators should give due regard (but not be limited) to:

- a) any additional fuel required for in-flight diversion out of the conflict area;
- b) any deferred item in accordance with the minimum equipment list, if applicable for take-off and departure from the conflict zone without refuelling;
- c) consideration of emergency and non-normal procedures, such as depressurization and engine failure;
- d) alternate communication and navigation methodologies to account for the potential of conflict-associated jamming or electric interference that disrupts normal aircraft communications and navigation;
- e) availability and serviceability of aircraft equipment needed to facilitate identification of the aircraft by military units;
- f) use of procedures and means to ensure that the pertinent authorities are advised of the flight plan; and
- g) ensuring monitoring of the appropriate frequencies.

3.2.2 The absence of any restrictions in foreign airspace should not preclude the operator from making its own determination on the safety/security risks of the airspace to be flown through. Various information sources can be used (e.g. government advisories, other aircraft operators, open-source intelligence) including in-house resources tasked with flight route management.

3.2.3 Aircraft operators have a need to know of any material regarding airspace restrictions or (potential) hazards/threats that affect the safety and security of their operations. This material includes available information and recommendations on conflict zones, which should be incorporated into their risk assessment and decision-making processes. Aircraft operators should furthermore share their own risk assessment information with their national authorities and are encouraged to share this information with other operators and service providers.

3.2.4 The operator should ensure that there is a mechanism to facilitate the communication of necessary information to the pilot-in-command, in real time. While information can nearly always be provided before take-off, in some instances, because of rapidly changing circumstances, updated information must be provided en-route for in-flight re-planning, as this could result in a change to the intended route. The collection of relevant information is further addressed in 4.3.

3.2.5 Flight crews should maintain extra vigilance when knowingly operating over or near a conflict zone. Maximum effort should be taken by operators to facilitate identification of the aircraft by military units (i.e. weather radar, transponder, radio altimeter, lighting) and ensure that appropriate radio communication frequencies are monitored.