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Doc 10084

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

Second Edition, 2018



Approved by and published under the authority of the Secretary General

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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) took several initiatives, the first of which was to host a special high-level meeting on 29 July 2014 with the Directors General of the Airports Council International (ACI), the Civil Air Navigation Services Organisation (CANSO), and the International Air Transport Association (IATA). This meeting issued a joint statement expressing both the 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.

The Secretary General of ICAO established the Task Force on Risks to Civil Aviation arising from Conflict Zones (TF RCZ) to advise the Secretariat and, in turn, report to the ICAO Council. The TF RCZ developed a work programme with twelve objectives, including the establishment of a centralized system which would consolidate the available information related to conflict zones. The Second High-level Safety Conference (HLSC 2015), held from 2 to 5 February 2015 at ICAO Headquarters noted the progress and conclusions of the TF RCZ, endorsed its pilot projects and recommended the implementation of these objectives. During its 204th Session, the ICAO Council approved in principle an interim procedure for Member States to establish the Conflict Zone Information Repository (CZIR) as a tool to disseminate information related to risks to civil aviation arising from conflict zones. On 2 April 2015, the ICAO CZIR was launched.

This document, initially drafted under the title *Civil Aircraft Operations Over Conflict Zones* (Restricted), and containing advice from the ICAO Aviation Security Panel Working Group on Threat and Risk (WGTR), was provided to the ICAO Secretariat in 2014 as a contribution to the work of the TF RCZ on the risks for civil aviation of flying over conflict zones at cruising altitudes. The document provided the basis for discussion of this subject at HLSC 2015 and covered the risks from both deliberate and unintentional attacks on civil aircraft. *Civil Aircraft Operations Over Conflict Zones* (Restricted) was first published in November 2016 and reissued in April 2017 as Doc 10084 (Restricted).

The 26th Meeting of the Aviation Security Panel (AVSECP/26) held from 13 to 17 April 2015, considered actions taken by ICAO to review and mitigate the risks to civil aviation arising from conflict zones, including the WGTR's advice, and recommended that ICAO disseminate the advice on the overall risks of overflying conflict zones in order to assist States and industry in making decisions on flying over or near conflict zones — a recommendation that was endorsed by the ICAO Council at the Fourth Meeting of its 205th Session on 15 June 2015.

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. The relevant safety recommendations are presented below.

During the 25th AVSEC World Conference held from 25 to 27 October 2016, held jointly by IATA, ICAO and ACI, existing tools and mechanisms, as well as next generation systems, to share risk-based information relevant to the operation of civil aircraft, were presented.

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 service 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 a desire to develop solutions allowing for timely and automated access to such information.

Dutch Safety Board MH17 accident investigation relevant safety recommendations

To ICAO:

- (1) Incorporate in Standards that States dealing with an armed conflict in their territory shall at an early stage publish information that is as specific as possible regarding the nature and extent of threats of that conflict and its consequences for civil aviation. Provide clear definitions of relevant terms, such as conflict zone and armed conflict.
- (3) Update Standards and Recommended Practices related to the consequences of armed conflicts for civil aviation, and convert the relevant Recommended Practices into Standards as much as possible so that States will be able to take unambiguous measures if the safety of civil aviation may be at issue.

To ICAO and IATA:

- (5) Encourage States and operators who have relevant information about threats within a foreign airspace to make this available in a timely manner to others who have an interest in it in connection with aviation safety. Ensure that the relevant paragraphs in the ICAO Annexes concerned are extended and made more strict.

To ICAO:

- (6) Amend relevant Standards so that risk assessments shall also cover threats to civil aviation in the airspace at cruising level, especially when overflying conflict zones. Risk increasing and uncertain factors need to be included in these risk assessments in accordance with the proposals made by the ICAO Working Group on Threat and Risk.

To States (States of Operator):

- (8) Ensure that operators are required through national regulations to make risk assessments of overflying conflict zones. Risk increasing and uncertain factors need to be included in these assessments in accordance with the proposals by the ICAO Working Group on Threat and Risk.

To ICAO and IATA:

- (9) In addition to actions already taken, such as the website (ICAO Conflict Zone Information Repository) with notifications about conflict zones, a platform for exchanging experiences and good practices regarding assessing the risks related to the overflying of conflict zones is to be initiated.

In its 210th Session, the Council requested the Secretariat to continue to explore how to improve States' risk-management capabilities, the sharing of risk information concerning operations over or near conflict zones, and relevant assessment processes. This was expected to be achieved through a continuous review of all relevant ICAO Standards and Recommended Practices (SARPs) and guidance material. In addition, the work was to be completed before 2019 in accordance with the outcomes of the 39th Session of the ICAO Assembly held from 27 September to 6 October 2016.

Considering the results from the 25th AVSEC World Conference, the survey conducted by the Secretariat and the decline in the number of postings in the CZIR, the Council noted that the ICAO CZIR had ceased to function as a means to gather and disseminate specific risk-based information concerning operations over or near conflict zones. The Council directed the Secretariat to discontinue the CZIR and provisionally approved the transition of 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, in its 212th Session, the Council noted that in response to the HLSC 2015 objectives, ICAO had implemented a range of initiatives focused on risk mitigation for civil aircraft operations, strengthening risk management capabilities, and sharing risk information related to air operations over or near conflict zones. The Council welcomed recent developments in the aviation sector whereby the information that had been provided on the ICAO web-library of risk-based information was now being provided by other international organizations in real-time. In light of these developments and noting the limited number of links posted on the web-library, the Council 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.

The second edition of Doc 10084 has been further amended 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 is published 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 this edition 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, the Secretariat amended the document's classification from restricted to non-restricted.

Work in progress

This second edition of Doc 10084 takes into account the work in progress of the following future amendments of ICAO provisions:

Annex 6 — *Operation of Aircraft*, Part I: Flight Operations. The need for the operator to ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the airspace containing the intended route from aerodrome of departure to aerodrome of arrival, including the intended take-off, destination and en-route alternate aerodrome(s), can be safely used for the planned operation, and where conflict zones are overflown, to conduct a risk assessment and to take appropriate risk mitigation measures to ensure a safe and secure flight.

Doc 10088, *Manual on Civil/Military Cooperation in Air Traffic Management*. Review and upgrade of the existing Circular 330, *Civil/Military Cooperation in Air Traffic Management* for coordination between military and civil aviation authorities.

GLOSSARY

ACRONYMS AND ABBREVIATIONS

ACI	Airports Council International
AIC	aeronautical information circular
AIP	aeronautical information publication
ANSP	air navigation service provider
ASP	aviation security programme
ATS	air traffic services
ATM	air traffic management
AVSEC	aviation security
AVSECP	Aviation Security Panel
CANSO	Civil Air Navigation Services Organisation
CCT	Contingency coordination team
Circ	Circular
CZIB	conflict zone information bulletin
CZIR	conflict zone information repository
DfT	Department for Transport
DGAC	Direction Générale de l'Aviation Civile
DG HOME	Directorate-General Migration and Home Affairs
Doc	Document
EASA	European Aviation Safety Agency
EU	European Union
EEAS	European External Action Service
FIR	Flight information region
HLSC	High-level Safety Conference
IATA	International Air Transport Association
IBAC	International Business Aviation Council
ICAO	International Civil Aviation Organization
JTAC	Joint Terrorism Analysis Centre
MANPADS	man-portable air defence systems
MH17	Malaysia Airlines flight MH17
NCASP	National civil aviation security programme
NCTV	National Coordinator for Security and Counterterrorism
NOTAM	Notice to airmen
PANS	Procedures to Air Navigation Services
PARAC	Pole d'Analyse de Risques de l'Aviation Civile
PIB	Pre-flight information bulletin
RCS	Risk Context Statement
RCZ	Conflict Zones Network of Focal Points
SAM	surface-to-air missile
SARPs	Standards and Recommended Practices
SMI	safety management implementation
SMM	Safety Management Manual
SMS	safety management system
SSP	State safety programme
TF RCZ	Task Force on risks to Civil Aviation arising from Conflict Zones
WGTR	Working Group on Threat and Risk

DEFINITIONS

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

Acceptable level of safety performance (ALoSP). The minimum level of safety performance of civil aviation 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, of 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 those 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 service 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.

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. Airspace over areas where armed conflict is occurring or is likely to occur between militarized parties, and is also taken to include airspace over areas where such parties are in a heightened state of military alert or tension, which might endanger civil aircraft.

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 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.

MANPADS (Man-Portable Air Defence Systems). Shoulder-launched surface-to-air missiles. These are widely available in many countries, particularly in conflict areas, portable and can be used with relatively limited training. MANPADS are capable of bringing down aircraft, but not of reaching cruising altitudes.

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

Risk. The potential for an unwanted or calculated outcome resulting from an occurrence. Risk can be estimated by considering the likelihood of threats, vulnerabilities and consequences or impacts.

Risk index matrix. A matrix that is used during 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 defences or preventive controls to lower the severity and/or likelihood of a hazard's or threat's projected consequence.

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.

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 service providers and certified aerodromes.

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

Surface-to-Air Missiles (SAMs). Any weapon that may be fired at an aircraft from the ground (including MANPADS), but in this context, is taken to mean advanced military equipment that is capable of attacking airborne targets at altitudes of at least 25 000 ft (7 600 m).

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. A man-made occurrence, individual, entity, or action that has, or indicates, the potential to harm life, information, operations, the environment and/or property.

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.

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 — *Security — Safeguarding International Civil Aviation Against Acts of Unlawful Interference*
Annex 19 — *Safety Management*

GUIDANCE MATERIAL

ICAO Aviation Security Global Risk Context Statement (Restricted)
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 9985, *Air Traffic Management Security Manual*
Doc 10088, *Manual on Civil/Military Cooperation in Air Traffic Management* [replaces Circular 330]

Chapter 1

INTRODUCTION

1.1 PURPOSE AND SCOPE

1.1.1 This manual contains advice to States, aircraft operators, (civil and military) air navigation service providers (ANSPs), and other entities deemed appropriate on the subject of risk assessments for civil aircraft operations over or near conflict zones. It contains consolidated guidance to support implementation of relevant 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 Noting that States should notify threats and hazards in their sovereign and delegated airspace, and to coordinate activities so as to minimize any such threats and hazards, this manual aims to provide broad advice on the global risks to civil aviation, and from this to identify the main risk factors that could be taken into account by States, aircraft operators, and ANSPs in conducting their own more geographically-specific risk assessments. It is important to note that ultimately the operators and service providers are the entities that will conduct an operational risk assessment specific to the type and extent of their approved operations.

1.1.3 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. However, some of the considerations and conclusions would apply also to air-to-air missiles launched from fighter aircraft. 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

1.1.4 The decision as to whether a civil aircraft will be flown through airspace that could otherwise be considered unsafe relies on the various parties involved, i.e., the State that manages the airspace, aircraft operators, ANSPs, the State of the Operator, ICAO, regional civil aviation authorities, and other 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*, Annex 11 — *Air Traffic Services*, Annex 15 — *Aeronautical Information Services*, Annex 17 — *Security*, and Annex 19 — *Safety Management*, as well as related guidance material (*ICAO Aviation Security Global Risk Context Statement* (Restricted), Docs 8126, 8973 (Restricted), 9426, 9433, 9554, 9859, 9985, and 10088). The manual also describes the risk assessment processes leading to final decision-making and provides best practice examples drawn from States and industry.

1. *Man-Portable Air Defence Systems (MANPADS)* — Restricted, ICAO, First Edition, July 2015.

