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Seychelles Technical Standards – Aerodromes
ICAO Manual on Certification of Aerodromes (Doc 9774)
ICAO Safety Management Manual (Doc 9859)

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Note – *Aerodrome Safety Publications are published by the SCAA for purposes of promulgating supplementary guidance materials to the Standards and Recommended Practices (SARPs) in the Seychelles Technical Standards - Aerodromes. The publications are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means, of complying with SARPs. Aerodrome Safety Publications may explain certain regulatory requirements by providing interpretive and explanatory materials.*

While they often provide recommendations, in accordance with STS-ADR, Chapter 2, Subpart A, Provision 2.2.2, any provision within these publications that uses the terms "shall" or "must" is considered mandatory and enforceable. Such provisions along with any figures, appendices and tables associated with it carry the same weight as the primary text of the STS and must be complied with at all times.

1. Purpose

The purpose of this Aerodrome Safety Publication (ASP) is to provide supplementary guidance to aerodrome operators in the development and submission of aeronautical studies, particularly when deviations from established standards or proposed operational changes may impact the safety of aircraft operations.

2. Applicability

2.1. This ASP applies to all aerodrome operators subjected to Regulation 61 of the Civil Aviation (Safety) Regulations, 2017 and the Seychelles Technical Standards – Aerodromes.

2.2. This ASP is applicable to an aerodrome operator who intends to or holds an aerodrome certificate

3. Cancellation

3.1. Nil.

4. Introduction

4.1 STS ADR 2.4.1 states that where an aerodrome operator is not able to comply with any standard or recommended practice, an aeronautical study may be conducted to assess the impact of deviations from the standards and recommended practices. The purpose of such study is to present alternative means of ensuring the safety of aircraft operations, to estimate the effectiveness of each alternative and to recommend procedures to compensate for the deviation.

4.2 An aeronautical study is mostly frequently undertaken during the planning of a new airport or new airport facility, or during the certification of an existing aerodrome. It may also be carried out when aerodrome standards or recommended practices cannot be met as a result of development.

4.3 An aeronautical study is a study of an aeronautical nonconformance carried out by an aerodrome operator to identify possible solutions and select a solution that is acceptable without degrading safety. The Aerodromes & Ground Aids Inspectorate will review these studies on a case by case basis and determine their acceptability.

4.4 Technical analysis will provide justification for a deviation on the grounds that an equivalent level of safety can be attained by other means. It is generally applicable on situations where the cost of correcting a non-conformance that violates a standard is excessive but where the unsafe effects of the problem can be overcome by some procedural or other means which offer both practical and reasonable solutions.

4.5 In conducting a technical analysis, an aerodrome operator should draw upon their practical experience and specialized knowledge. The aerodrome operator may also consult other specialists in relevant areas. When considering alternative procedures in the deviation approval process, it is essential to bear in mind the safety objective of the aerodrome certification regulations and the applicable standards and recommended practices so that the intent of the regulations is not circumvented.

4.6 In some instances, the only reasonable means of providing an equivalent level of safety

is to adopt suitable procedures and to require, as a condition of certification, that cautionary advice be published in the appropriate AIS publications.

4.7 The determination to require caution will be primarily dependent on two considerations:

i. Pilots need to be made aware of potentially hazardous conditions; and

ii. the responsibility of the SCAA to publish deviations from standards and recommended practices that would otherwise be assumed under the certificate status.

5. Definitions & Abbreviations

5.1 Abbreviations

ICAO	International Civil Aviation Organization
STS-ADR	Seychelles Technical Standards – Aerodromes
SCAA	Seychelles Civil Aviation Authority
AIP	Aeronautical Information Publication
NOTAM	Notice to Airmen
SMS	Safety Management System

5.2 Definitions

Aerodrome Operations
The activities and processes involved in managing aircraft movement, ground handling, airside maintenance, and passenger or cargo services within an aerodrome environment.

Aeronautical Study
An aeronautical study is a study of an aeronautical problem to identify possible solutions and select a solution that is acceptable without degrading safety.

Authority
The Authority means the Seychelles Civil Aviation Authority (SCAA).

Hazard Log
A structured record used in safety assessments to document potential hazards, associated risks, and mitigation measures for aerodrome operations.

Risk Assessment
A systematic process of identifying hazards, analyzing their impact, and determining appropriate measures to minimize safety risks in aerodrome operations.

Deviation
Any planned or unplanned departure from existing aerodrome regulations, operational standards, or infrastructure specifications.

Safety Mitigation Measures
Actions taken to reduce identified risks to an acceptable level, ensuring safe operations within the aerodrome.

6. Overview of an Aeronautical Study

6.1 The objectives of an aeronautical study are as follows:

a) To study the impact of a deviation from the national standards and regulations

b) To present alternative solutions to provide an acceptable level of safety;

c) To estimate the effectiveness of each alternative; and

d) To recommend suitable operating procedures/restrictions or other measures to mitigate safety risks arising from the deviation.

6.2 An aeronautical study is a structured process used to evaluate operational changes, regulatory deviations, or safety concerns within an aerodrome environment. The primary purpose of conducting an aeronautical study is to ensure compliance with safety regulations while maintaining efficient airport operations. By assessing whether a proposed change or deviation from established standards meets an acceptable level of safety, the study plays a critical role in mitigating risks. It systematically analyzes potential hazards and implements control measures to maintain or improve safety. Additionally, it supports decision-making by providing aerodrome operators, regulatory authorities, and stakeholders with evidence-based recommendations for safe aerodrome operations.

Note – Changes on an aerodrome can include changes to procedures, equipment, infrastructures, safety works, special operations, regulations, organization, etc.

6.3 Beyond safety and compliance, an aeronautical study also facilitates the optimization of operational efficiency by balancing safety requirements with the practical needs of an aerodrome, minimizing disruptions, and ensuring smooth functionality. It is often a necessary step in securing regulatory approval when deviations from national aviation regulations and standards are required. Moreover, the study fosters stakeholder engagement by encouraging collaboration among airlines, air traffic control, airport management, and regulators, ensuring a well-rounded and holistic approach to risk mitigation.

6.4 By conducting an aeronautical study, aerodrome operators can demonstrate due diligence in safety management, enhance regulatory compliance, and minimize operational risks while ensuring that aerodrome operations continue to function at optimal safety and efficiency levels.

6.5 A process flowchart for conducting an aeronautical study in **Appendix D** illustrates a structured visual representation of the key steps involved in assessing and managing operational changes or deviations in an aerodrome.

7. Aeronautical Study

7.1 The aeronautical study must be done by the aerodrome operator's competent technical experts with relevant practical experience and specialised knowledge. The aerodrome operator may also consult other specialists in relevant areas.

7.2 An aerodrome operator must consult their external and internal stakeholders (e.g.

airlines, affected departments, etc.) prior to the conduct of an aeronautical study. These consultations allows the proposed deviation to be viewed from different perspectives and keep the different parties involved aware of the proposed deviation.

7.3 The safety risk assessment in an aeronautical study is the identification, analysis and elimination, and/or mitigation of risks to an acceptable level of safety in accordance with the aerodrome operator's Safety Management System (SMS). A safety risk assessment usually consists of the following:

a) identification of hazards and consequences; and

b) safety risk assessment and mitigation

7.4 An example of the format of a list of potential hazards (also known as a "hazard log") can be found in **Appendix A.**

7.5 The aerodrome operator may recommend alternative operating procedures/restrictions or other measures that will achieve the safety objectives of other applicable regulations and standards to manage the proposed deviation. In addition, the aerodrome operator should estimate the effectiveness (through trials, surveys, simulations etc.) of each recommendation listed so as to identify the best means to address the proposed deviation.

7.6 The aerodrome operator should devise methods to monitor the status of the deviation to ensure that the implemented recommendations can be effectively carried out, and that the level of safety is not compromised at any time. This assessment also provides feedback on the recommendations.

7.7 The aerodrome operator, after taking into account all the necessary considerations listed above, come to a decision on any safety measures that should be adopted. The aerodrome operator should also specify a date to put in place all the necessary safety measures and show how they maintain the same level of safety with the recommended safety measures mentioned in the aeronautical study.

7.8 The aerodrome operator should also ensure that the affected parties are well informed of such changes (e.g. inform pilots of potentially hazardous conditions). The notification procedure including process flow, time frame and different means of notification such as the Aeronautical Information Publication (AIP) and Notice to Airmen (NOTAM) should be included in the study.

7.9 A template for the report of the aeronautical study can be found in **Appendix B.**

7.10 The aerodrome operator should review the aeronautical study regularly or whenever there may be significant changes that would affect the relevance of the study. Any changes to the aeronautical study should be evaluated and properly documented. A checklist is provided in **Appendix C** to ensure that the aeronautical study is thoroughly conducted and documented.

8. Situations Requiring an Aeronautical Study

8.1 An aeronautical study is conducted under various circumstances, including but not limited to:

a. Introduction of New Infrastructure or Facilities
When planning the construction of a new airport or a significant upgrade to existing aerodrome facilities, such as new taxiways, runways, or terminals.

b. Certification of an Existing Aerodrome
During the aerodrome certification process, aerodrome operators must assess their compliance with safety and operational standards. An aeronautical study helps identify potential risks and ensures that all safety requirements are met.

c. Deviations from Regulatory Requirements
If an aerodrome is unable to fully comply with established national regulations and standards due to physical or operational constraints, an aeronautical study is required to evaluate alternative solutions while maintaining an acceptable level of safety.

d. Changes in Operational Procedures
Modifications in aerodrome operations, such as new aircraft handling procedures, updated air traffic control procedures, or changes in emergency response protocols, may require an aeronautical study to assess their impact on safety and efficiency.

e. Introduction of New Aircraft Types
When an aerodrome plans to accommodate larger or different aircraft categories (e.g., transitioning from Code 4E to Code 4F operations), an aeronautical study is necessary to evaluate infrastructure adequacy, operational feasibility, and risk mitigation strategies.

f. Assessment of Hazardous Conditions
In cases where new safety concerns arise—such as increased wildlife hazards, environmental changes, or unexpected operational constraints—an aeronautical study is conducted to determine suitable mitigation measures.

g. Assessment of Aeronautical Impact of new or existing obstacles
To investigate an aeronautical concern arising from the introduction of a new or existing obstacle and evaluating the impact of the obstacle on flight operations and identify possible measures that can mitigate these concerns.

h. Temporary or Emergency Deviations
When an aerodrome implements temporary operational changes due to construction work, extreme weather conditions, or unforeseen circumstances, an aeronautical study helps ensure that alternative safety measures are in place.

8.2 By undertaking an aeronautical study in these scenarios, aerodrome operators can systematically assess the risks associated with operational changes, propose viable

solutions, and ensure continued compliance with aviation safety standards. The findings from the study help establish new procedures, restrictions, or modifications that ensure aircraft operations remain safe and efficient under evolving conditions.

9 Determinations

9.1 Following completion of the aeronautical study, the aerodrome operator must submit the study to the Authority no later than **30 working days** prior to the implementation of any proposed changes, for formal review, approval and determination. In the event that the study is not approved, the aerodrome operator shall review, revise, and re-submit the study for reconsideration by the Authority.

9.2 Determinations will be one of the following:

a. **Unobjectionable**
Where the Authority is satisfied that the proposed action will not adversely affect the safe and efficient use of airspace by aircraft, nor the safety of persons or property on the ground.

b. **Conditional**
Where the study identifies objectionable aspects of the proposed action but specifies conditions which, if complied with, would satisfy the Authority that the proposed action will not adversely affect the safe and efficient use of airspace by aircraft, nor the safety of persons or property on the ground.

c. **Objectionable**
Where the study identifies objectionable aspects of the proposed action. The determination shall specify the reasons for finding the proposed action objectionable.

Note: Refer to the relevant ASP for the application of the deviation from technical standards

10 Acceptance by the Authority

10.1 The right to accept or reject the results of the Aeronautical Study rests fully with the Authority.

11 Queries

11.1 Any queries relating to this Aerodrome Safety Publication should be addressed to Head of Aerodromes & Grounds Aids Inspectorate on seyaga@scaa.sc

Aerodromes & Ground Aids Inspectorate
Seychelles Civil Aviation Authority

APPENDIX A – HAZARD LOG

Note: Appendix A provides aerodrome operators with a suggested hazard log for safety assessment of an aeronautical study. Aerodrome operators may use this log as a guide. The aerodrome operator's log should be constantly updated throughout the aeronautical study life cycle.

A sample hazard log for safety assessment of an aeronautical study is as shown below:

No.	Type of Operation or activity	Hazard and Description	Consequences Identified	Risk Index	Risk Tolerability	Risk Control / Mitigation	Residual Risk Index	Residual Risk Tolerability	Action, If any to further reduce risk(s) and the resulting risk index and the residual risk tolerability
1	*Aircraft & Vehicle Operations*	*Unauthorized vehicle entering runway due to poor coordination between ATC and airside drivers*	*Runway incursion leading to collision between aircraft and vehicle; potential injury or fatality; damage to aircraft*	*4D*	*Not Tolerable*	*- Strict radio communication procedures - Driver training and airside permits - Installation of stop bars and signage - Escort for non-permitted vehicles*	*2C*	*Tolerable*	*Conduct periodic driver competency checks; review R/T phraseology compliance; Resulting risk index: 1C; Residual risk tolerability: Acceptable*

APPENDIX B – TEMPLATE FOR REPORT OF AN AERONAUTICAL STUDY

1. The report of an aeronautical study should include the following sections:

i. Introduction
ii. Background.
iii. Description of Non-Compliance or Proposed Change
iv. Applicable Regulations and Standards
v. Hazard Identification
vi. Safety Risk Assessment
vii. Mitigation Measures
viii. Recommendations.
ix. Proposed Means of Monitoring the deviation; and
x. Conclusion

1.2 Introduction

This section should clearly state the aim of the aeronautical study, identifying:

- The safety concerns that have triggered the study
- The safety measures to be implemented to maintain or restore safety levels
- The specific requirement or regulation the study is addressing

1.3 Background

Information on the current situation faced by the aerodrome operator, current procedures that have been put in place and other relevant details should be clearly stated and explained in this sub-section. Clear explanation should be provided, particularly on the following:

i. What exists today and why a change or deviation is needed
ii. Areas of the aerodrome affected by the proposed change or non-compliance
iii. Timeline for proposed development or compliance
iv. Operational impact during the change
v. Justification for reviewing current processes

1.4 Description of Non-Compliance or Proposed Change

Describe in detail:

i. The specific non-compliance or deviation from ICAO standards (e.g., RESA, runway width)

ii. The proposed change to aerodrome layout, procedures, or operations

iii. Any temporary or permanent nature of the deviation

1.5 Applicable Regulations and Standards

Reference the national aviation provisions (e.g., STS ADR), local civil aviation regulations, and any exemptions or flexibility clauses applicable.

1.6 Hazard Identification

List all potential hazards associated with the deviation or proposed change. These may be gathered through expert judgment, operational experience, or stakeholder input.

Examples:

- Reduced runway width may increase the risk of runway excursion
- Operating larger aircraft may exceed current pavement strength

1.7 Safety Risk Assessment

Present the safety risk assessment, using a recognized methodology (e.g., ICAO Safety Risk Matrix).

- Evaluate likelihood and severity of each identified hazard
- Categorize risks (e.g., Acceptable, Tolerable, Unacceptable)

Refer to the hazard logs as per paragraph 7.4 of ASP guidance.

1.8 Mitigation Measures

Outline the safety measures, procedures, and restrictions proposed to mitigate risks to an acceptable level.

Examples:

- Limit operations to daylight hours
- Use marshallers for Code F aircraft
- Implement enhanced pilot briefings and ground markings

1.9 Recommendations

(Refer to section 7.5)

Details of the recommendations to address the safety concerns arising from the proposed deviation, including the notifications that will need to be prepared to inform the affected parties arising from the recommendations (e.g. AIP, NOTAM).

1.10 Means of Monitoring of the Deviation

Describe how the aerodrome operator will monitor the status of the deviation and assess whether mitigation measures remain effective.

1.11 Conclusion

Summarize the study's findings and state:

- Whether the proposed deviation can be safely managed
- Which safety measures will be implemented
- The timeline for implementation

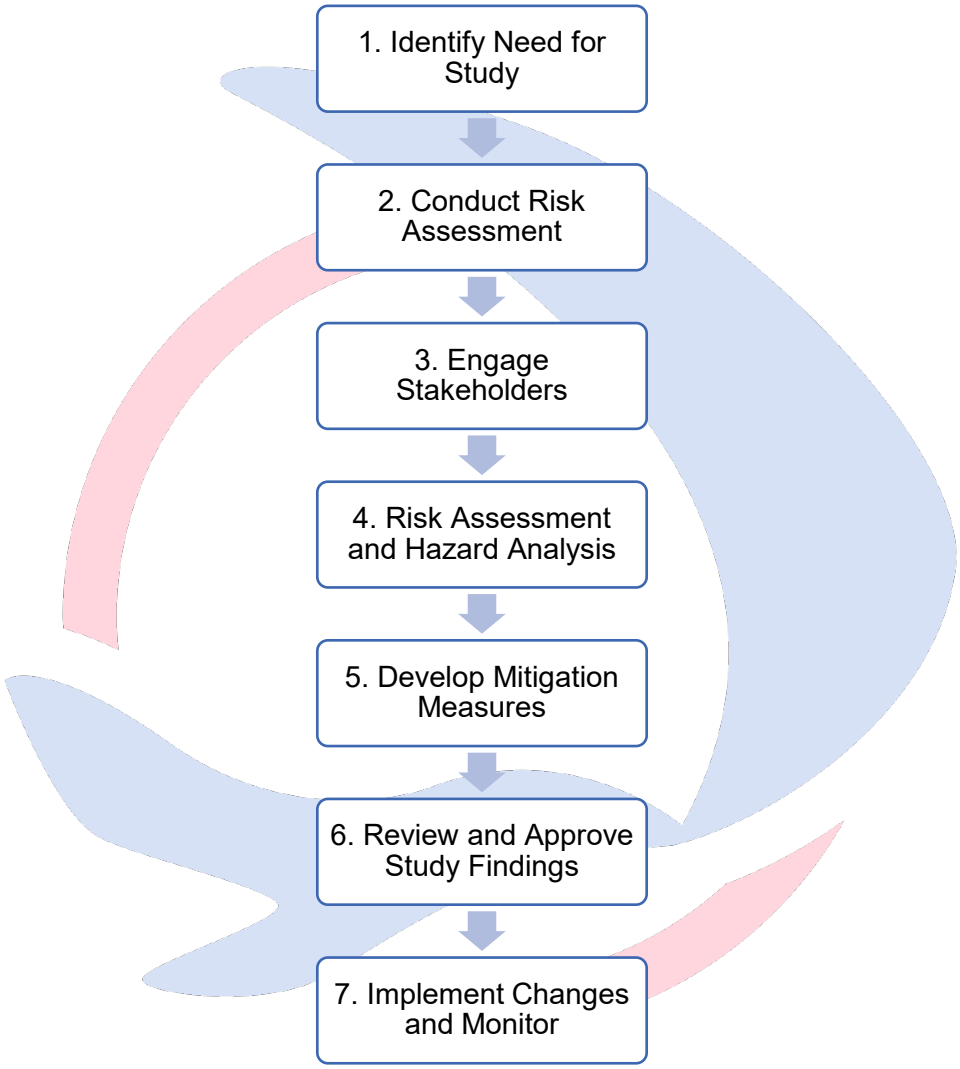
APPENDIX C – CHECKLIST FOR AERONAUTICAL STUDY

The following checklist is a guide for developing an aeronautical study.

CHECKLIST FOR AERONAUTICAL STUDY	Yes	No	Remarks
Aim of the study including (a) Address safety concerns, (b) Identify safety measures, and (c) Make reference to specific requirement in STS-ADR;			
Consultation with stakeholders, senior management team and divisions/departments affected;			
The study is approved by a senior executive of the organisation;			
Background information on the current situation;			
Proposed date for complying with the requirements, if the deviation is due to development of the aerodrome;			
Safety assessment including (a) identification of hazards and consequences and (b) risk management;			
The safety assessment used in the study (e.g. hazard log, risk probability and severity, risk assessment matrix, risk tolerability and risk control/mitigation);			
Recommendations (including operating procedures/restrictions or other measures to address safety concern) of the aeronautical study and how the proposed deviation will not pose a drop in the level of safety;			
Estimation of the effectiveness of each recommendation listed in the aeronautical study;			
Notification procedure including process flow, time frame and the publication used to promulgate the deviation;			
Conclusion of the study;			
Monitoring of the deviation; and			
Notification to SCAA once the temporary deviation has been corrected.			

APPENDIX D – PROCESS FLOWCHART

The process flowchart for conducting an aeronautical study provides a structured visual representation of the key steps involved in assessing and managing operational changes or deviations in an aerodrome. This structured approach ensures that all safety concerns are identified, risk mitigation measures are developed, and continuous monitoring is established to maintain compliance and operational efficiency.



Step 1: Identify the Need for an Aeronautical Study

The process begins with recognizing the need for an aeronautical study. This can arise due to various factors, such as operational changes, infrastructure modifications, regulatory deviations, introduction of new aircraft types, or safety concerns identified through incident reports. Once the need is identified, aerodrome operators must define the scope and objectives of the study, ensuring that all relevant factors are considered.

Step 2: Conduct Preliminary Risk Assessment

Before proceeding with an in-depth study, a preliminary risk assessment is conducted

to determine the potential safety implications of the proposed change. This includes identifying possible hazards, assessing the likelihood and severity of risks, and determining whether further detailed analysis is required. If the initial risk assessment reveals significant safety concerns, a full aeronautical study is initiated.

Step 3: Engage Stakeholders and Collect Data

Stakeholder engagement is a crucial step in the process. Key stakeholders such as aerodrome operators, airlines, air traffic control, regulatory authorities (SCAA), and ground handling agencies are consulted to gather insights and concerns related to the proposed changes. Additionally, relevant data is collected, including historical safety records, operational performance metrics, regulatory requirements, and industry best practices.

Step 4: Detailed Risk Assessment and Hazard Analysis

Once stakeholder inputs and supporting data are gathered, a comprehensive risk assessment is conducted. This involves:

- Identifying specific hazards associated with the operational change or deviation.
- Analyzing risk levels using a risk matrix to determine probability and severity.
- Evaluating risk acceptability and deciding whether additional mitigation measures are necessary.

Developing alternative solutions that maintain an acceptable level of safety while meeting operational requirements.

Step 5: Develop and Implement Mitigation Measures

Based on the findings of the risk assessment, appropriate risk mitigation measures are developed. These may include modifications to operational procedures, adjustments to infrastructure, regulatory approvals, or additional safety protocols. Once the proposed measures are established, an implementation plan is created, outlining responsibilities, timelines, and monitoring mechanisms.

Step 6: Review and Approve the Study Findings

The aeronautical study's findings and recommendations are compiled into a formal report, which is then reviewed by senior aerodrome management and regulatory authorities. This step ensures that all safety considerations have been addressed and that the proposed changes comply with national regulations and standards. If necessary, further adjustments may be made based on regulatory feedback before final approval is granted.

Step 7: Implement the Changes and Monitor Performance

Once the study is approved, the recommended changes or deviations are implemented in the aerodrome environment. A structured monitoring and compliance program is established to ensure that the changes do not introduce unforeseen risks. This includes regular safety audits, incident tracking, stakeholder feedback collection, and performance reviews to assess the effectiveness of the implemented measures.