Safety Assessments for Aerodromes

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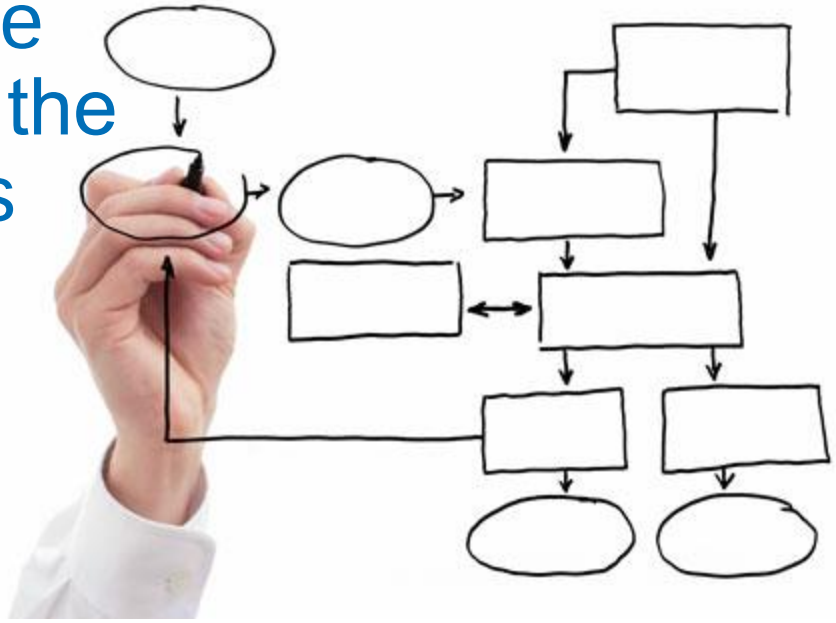
Safety Assessment

- A safety assessment is an element of the risk management process of an SMS that is used to assess safety concerns arising from, inter alia, deviations from standards and applicable regulations, identified changes at an aerodrome, or when any other safety concerns arise.

SAFETY ASSESSMENTS FOR AERODROMES

- A certified aerodrome operator implements an SMS acceptable to the State that, as a minimum:
  a) identifies safety hazards;
  b) ensures that remedial action necessary to maintain safety is implemented;
  c) provides for continuous monitoring and regular assessment of the achieved safety; and
  d) aims to make continuous improvement to the overall safety of the aerodrome.

- The safety assessment process addresses the impact of a safety concern, including a change or deviation, on the safety of operations at the aerodrome and takes into consideration the aerodrome's capacity and the efficiency of operations, as necessary.



- An aeronautical study, where permitted in Annex 14, Volume I, may be carried out when aerodrome standards cannot be met as a result of development.
- An aeronautical study is conducted to:
  - assess the impact of deviations from the aerodrome standards specified in Annex 14, Volume I, and the national regulations;
  - 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 (Doc 9774 — Manual on Certification of Aerodromes, Appendix 3).

- The suitability of the mitigation proposed and the need for alternative measures, operational procedures or operating restrictions for the specific operations concerned should be comprehensively evaluated.

When a safety concern, change or a deviation has an impact on several aerodrome stakeholders, consideration shall be given to the involvement of all stakeholders affected in the safety assessment process.

In some cases, the stakeholders impacted by the change will need to conduct a separate safety assessment themselves in order to fulfill the requirements of their SMS and coordinate with other relevant stakeholders.

When a change has an impact on multiple stakeholders, a collaborative safety assessment should be conducted to ensure compatibility of the final solutions.

A safety assessment considers the impact of the safety concern on all relevant factors determined to be safety-significant.

Items that may need to be considered when conducting a safety assessment:

a) aerodrome layout, including runway configurations; runway length; taxiway, taxilane and apron configurations; gates; jet bridges; visual aids; and the RFF services infrastructure and capabilities;

b) types of aircraft, and their dimensions and performance characteristics, intended to operate at the aerodrome;

c) traffic density and distribution;

d) aerodrome ground services;

Items that may need to be considered when conducting a safety assessment:

e) air-ground communications and time parameters for voice and data link communications;

f) type and capabilities of surveillance systems and the availability of systems providing controller support and alert functions;

g) flight instrument procedures and related aerodrome equipment;

h) complex operational procedures, such as collaborative decision-making (CDM);

Items that may need to be considered when conducting a safety assessment:

i) aerodrome technical installations, such as advanced surface movement guidance and control systems (A-SMGCS) or other air navigation aids;

j) obstacles or hazardous activities at or in the vicinity of the aerodrome;

k) planned construction or maintenance works at or in the vicinity of the aerodrome;

Items that may need to be considered when conducting a safety assessment:

l) any local or regional hazardous meteorological conditions (such as wind shear); and

m) airspace complexity, ATS route structure and classification of the airspace, which may change the pattern of operations or the capacity of the same airspace.

The State reviews the safety assessment provided by the aerodrome operator and its identified mitigation measures, operational procedures and operating restrictions, and is responsible for the subsequent regulatory oversight of their application.

Subsequent to the completion of the safety assessment, the aerodrome operator is responsible for implementing and periodically monitoring the effectiveness of the identified mitigation measures.

Safety Assessment Process

The primary objective of a safety assessment is to assess the impact of a safety concern such as a design change or deviation in operational procedures at an existing aerodrome.

Such a safety concern can often impact multiple stakeholders; therefore, safety assessments often need to be carried out in a cross-organizational manner, involving experts from all the involved stakeholders.

Prior to the assessment, a preliminary identification of the required tasks and the organizations to be involved in the process is conducted.

A safety assessment is initially composed of four basic steps:

a) definition of a safety concern and identification of the regulatory compliance;

b) hazard identification and analysis;

c) risk assessment and development of mitigation measures; and

d) development of an implementation plan for the mitigation measures and conclusion of the assessment.

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ASSESSMENT

SAFETY ASSESSMENT FLOW CHART

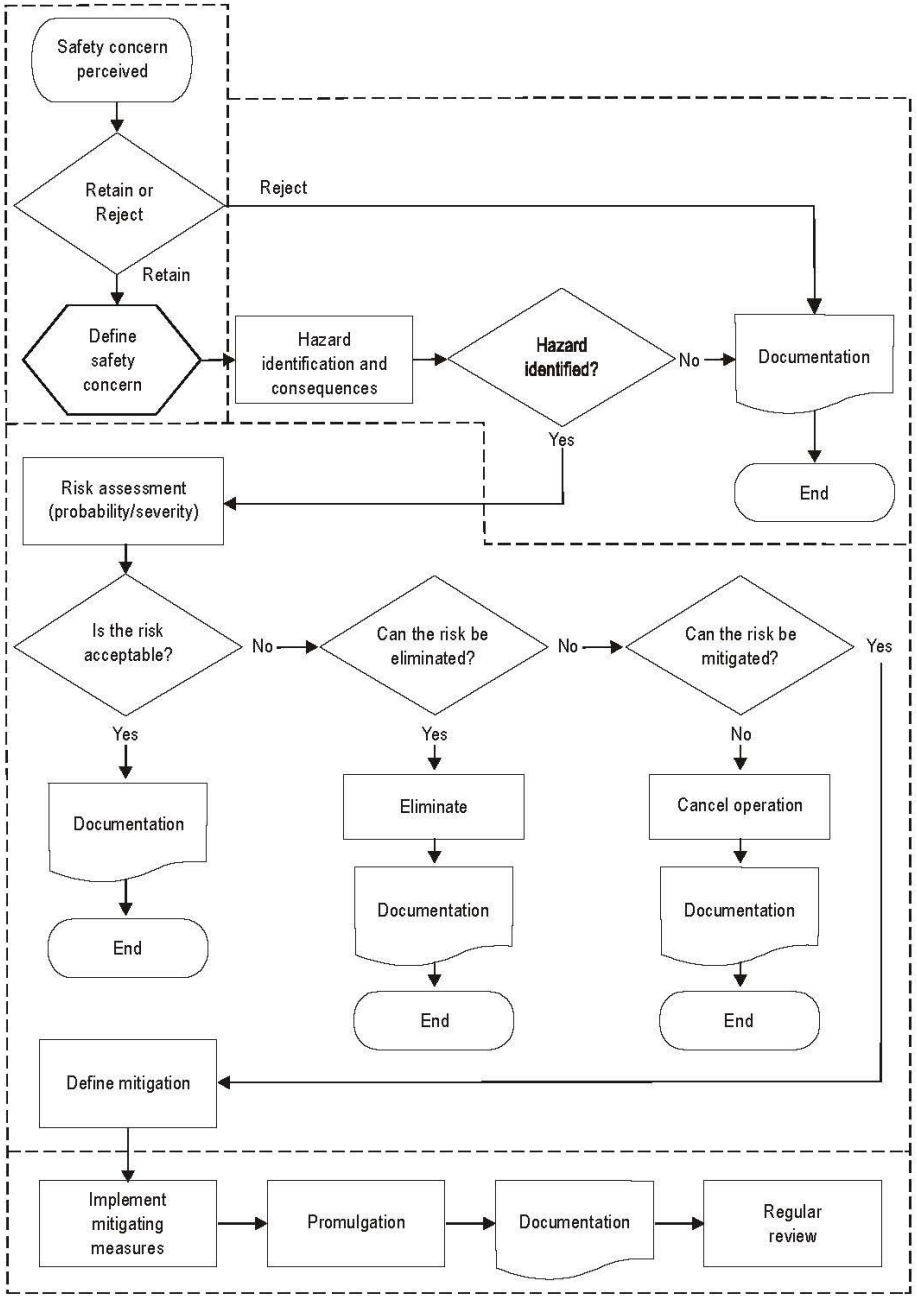
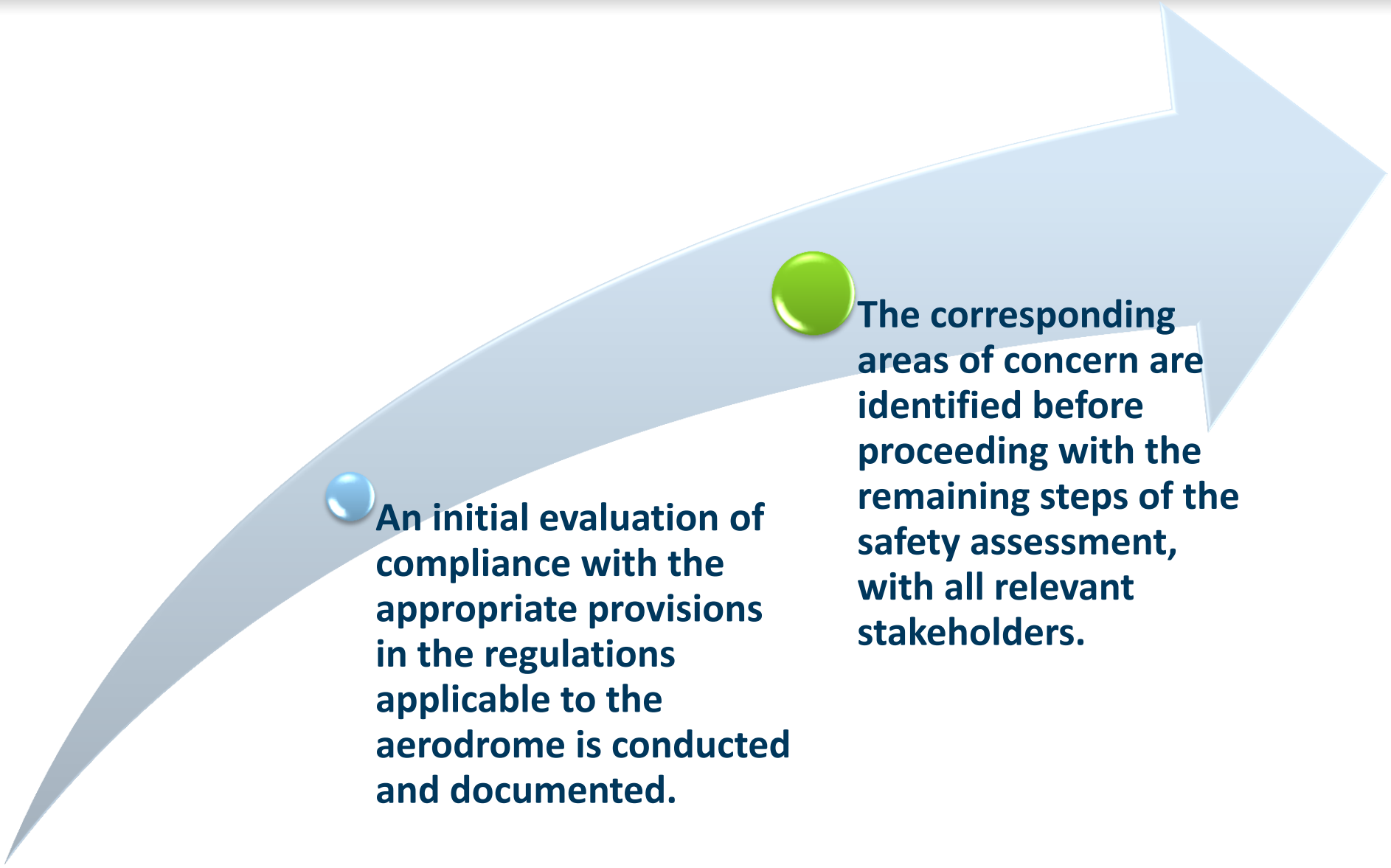


Figure 3-A-1. Flow chart to be used for the conduct of a safety assessment

Definition of a safety concern and identification of the regulatory compliance

Any perceived safety concerns are to be described in detail, including timescales, projected phases, location, stakeholders involved/affected as well as their potential influence on specific processes, procedures, systems and operations.

The perceived safety concern is first analyzed to determine whether it is retained or rejected. If rejected, the justification for rejecting the safety concern is to be provided and documented.



An initial evaluation of compliance with the appropriate provisions in the regulations applicable to the aerodrome is conducted and documented.

The corresponding areas of concern are identified before proceeding with the remaining steps of the safety assessment, with all relevant stakeholders.

Hazard identification

Hazards related to infrastructure, systems or operational procedures are initially identified using methods such as

- brain-storming sessions
- expert opinions
- industry knowledge
- experience
- operational judgment

The identification of hazards is conducted by considering:

- a) accident causal factors and critical events based on a simple causal analysis of available accident and incident databases;
- b) events that may have occurred in similar circumstances or that are subsequent to the resolution of a similar safety concern; and
- c) potential new hazards that may emerge during or after implementation of the planned changes.

The appropriate safety objective for each type of risk should be defined and detailed. This can be done through:

a) reference to recognized standards and/or codes of practices;	b) reference to the safety performance of the existing system;	c) reference to the acceptance of a similar system elsewhere; and	d) application of explicit safety risk levels.

- Safety objectives are specified in either quantitative terms or qualitative terms

- The selection of the safety objective is made according to the aerodrome operator's policy with respect to safety improvement and is justified for the specific hazard.

Risk assessment and development of mitigation measures

- The level of risk of each identified potential consequence is estimated by conducting a risk assessment.
- This risk assessment will determine the severity of a consequence and the probability of the consequence occurring and will be based on experience as well as on any available data.

Understanding the risks is the basis for the development of mitigation measures, operational procedures and operating restrictions that might be needed to ensure safe aerodrome operations.

The method for risk evaluation is strongly dependent on the nature of the hazards.

The risk itself is evaluated by combining the two values for severity of its consequences and probability of occurrence.

Once each hazard has been identified and analyzed in terms of causes, and assessed for severity and probability of its occurrence, it must be ascertained that all associated risks are appropriately managed.

An initial identification of existing mitigation measures must be conducted prior to the development of any additional measures.

All risk mitigation measures, whether currently being applied or still under development, are evaluated for the effectiveness of their risk management capabilities.

Development of an implementation plan and conclusion of the assessment

The last phase of the safety assessment process is the development of a plan for the implementation of the identified mitigation measures.

The implementation plan includes

- **time frames,**
- **responsibilities for mitigation measures**
- **as well as control measures that may be defined and implemented to monitor the effectiveness of the mitigation measures.**

Approval or Acceptance of a Safety Assessment

Management approval and implementation of the safety assessment, including future updates and maintenance, are the responsibility of the aerodrome operator.

The safety assessment conducted by the aerodrome operator is a core SMS function.

The State may, for specific reasons, require the submission of the specific safety assessment for approval/acceptance.

Approval or Acceptance of a Safety Assessment

The State establishes the type of safety assessments that are subject to approval/acceptance and determines the process used for that approval/acceptance.

Safety assessments conducted by service providers is a core SMS function of all service providers.

Each safety assessment itself (development and ownership), including management approval, implementation and future updates/ maintenance, should be the responsibility of the service provider.

Approval or Acceptance of a Safety Assessment

A safety assessment subject to approval/acceptance by the State shall be submitted by the aerodrome operator prior to implementation.

The State analyses the safety assessment and verifies that:

- **appropriate coordination has been performed between the concerned stakeholders;**
- **the risks have been properly identified and assessed, based on documented arguments;**
- **the proposed mitigation measures adequately address the risk; and**
- **the time frames for planned implementation are acceptable.**

Approval or Acceptance of a Safety Assessment

On completion of the analysis of the safety assessment, the State:

- either gives formal approval/acceptance of the safety assessment to the aerodrome operator as required in; or
- if some risks have been underestimated or have not been identified, coordinates with the aerodrome operator to reach an agreement on safety acceptance; or
- if no agreement can be reached, rejects the proposal for possible resubmission by the aerodrome operator; or
- may choose to impose conditional measures to ensure safety.

The State should ensure that the mitigation or conditional measures are properly implemented and that they fulfil their purpose.

Promulgation of Safety Information

The aerodrome operator determines the most appropriate method for communicating safety information to the stakeholders and ensures that all safety-relevant conclusions of the safety assessment are adequately communicated.

Promulgation of Safety Information

In order to ensure adequate dissemination of information to interested parties, information that affects the current integrated aeronautical information package (IAIP) or other relevant safety information is:

a) promulgated in the relevant section of the IAIP or automatic terminal information service (ATIS); and

b) published in the relevant aerodrome information communications through appropriate means.

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