



Naslov: Sigurnosna procjena za aerodrome

Title: Safety assessment for aerodromes

Recipients are asked to ensure that copy of this Safety Information is copied to all members of their staff who may have an interest in the information (including any 'in-house' and relevant outside contractors).

Pursuant to Article 6, paragraph 1, point 10 of the Law on Air Transport ("Official Gazette of Montenegro", No 30/12 and 30/17), the Civil Aviation Agency (hereafter: CAA), hereby issues:

SAFETY INFORMATION

Number: 2017/003 Rev.00

Regulation Reference:

- Law on Air Transport ("Official Gazette of Montenegro" No 30/12 and 30/17),
- Regulation on detailed requirements for issuance of aerodrome operator certificate ("Official Gazette of Montenegro" No 12/2014),
- Regulation on standards and criteria for use of maneuvering surfaces, facilities and equipment at aerodrome ("Official Gazette of Montenegro", No 29/2014, 59/2015 and 19/2017),
- ICAO Annex 14.

Application:

This safety information is applicable to the all aerodrome operators and other persons or organisations participating in development of the Safety assessment.

Purpose:

The purpose of this Safety information is to provide authorized/acceptance persons or organizations with guidance for the development of the Safety assessment and

Od primalaca se zahtijeva da kopija ove sigurnosne informacije bude prosljeđena svom osoblju kojem ova informacija može biti od koristi (uključujući sve unutrašnje organizacione jedinice i relevantne spoljne ugovorene organizacije).

Na osnovu člana 6 stav 1 tačka 10 Zakona o vazдушnom saobraćaju („Službeni list CG“, br. 30/12 i 30/17), Agencija za civilno vazduhoplovstvo (u daljem tekstu: ACV) donijela je:

SIGURNOSNU INFORMACIJU

Broj: 2017/003 Rev.00

Referentni propisi:

- Zakon o vazдушnom saobraćaju („Službeni list CG“, br. 30/12 i 30/17),
- Pravilnik o bližim uslovima za izdavanje certifikata operatora aerodroma („Službeni list CG“, br. 12/14),
- Pravilnik o standardima i kriterijumima za nesmetanu upotrebu operativnih površina, objekata, uređaja i opreme na aerodromu („Službeni list CG“, br. 29/14, 59/15 i 19/17),
- ICAO Annex 14.

Primjena:

Ova Sigurnosna informacija primjenjuje se na sve operatore aerodroma i druga lica i organizacije koji učestvuju u izradi Sigurnosne procjene.

Svrha

Cilj ove Sigurnosne informacije je da se licima ili organizacijama da uputstvo o izradi Sigurnosne procjene, u svrhu njenog odobravanja/prihvatanja, kao i da se



<p>to present the importance and significance of this assessment to conduct safety flight operations at the aerodrome.</p> <p>1. Introduction</p> <p>A safety assessment is an element of the risk management process of an Safety Management System (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.</p> <p>In case 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.</p> <p>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 are:</p> <ul style="list-style-type: none"> 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; 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); 	<p>prikaže njen značaj u cilju unapređenja sigurnog odvijanja letačkih operacija na aerodromu.</p> <p>1. Uvod</p> <p>Sigurnosna procjena je dio procesa upravljanja rizicima, u okviru Sistema upravljanja sigurnošću (SMS), koja se koristi za procjenu sigurnosnih problema nastalih, između ostalog, zbog odstupanja od standarda i primjenljivih propisa, identifikovanih promjena na aerodromu ili kada nastanu bilo koje drugi sigurnosni problemi.</p> <p>Ako sigurnosni problem, promjena ili odstupanje utiču na više zainteresovanih strana na aerodromu, prilikom procesa sigurnosne procjene u obzir se uzima uključenost svih pogođenih zainteresovanih strana.</p> <p>Prilikom sigurnosne procjene uzima se u obzir uticaj sigurnosnih problema na sve faktore koji su od sigurnosnog značaja. Stavke koje se mogu uzeti u obzir prilikom sprovođenja sigurnosne procjene su sljedeće:</p> <ul style="list-style-type: none"> a) konfiguracija (<i>layout</i>) aerodroma i poletno-sletnih staza; dužina poletno-sletne staze; konfiguracija platforme i rulnih staza; putnički mostovi; vizuelna pomagala; infrastruktura i sposobnosti spasilačko-vatrogasne zaštite; b) tipovi vazduhoplova koji namjeravaju da upotrebljavaju aerodrom, kao i njihove dimenzije i performanse; c) gustina i raspored saobraćaja; d) aerodromske zemaljske usluge; e) komunikacije vazduh-zemlja i vremenski parametri (odziv) za komunikacije glasom i data-link opremom; f) tip i mogućnosti sistema za nadzor i raspoloživost sistema koji će kontroloru letenja obezbijediti funkcije pružanja podrške i uzbunjivanja; g) procedure instrumentalnog letenja i prateća aerodromska oprema; h) kompleksne operativne procedure, kao što je združeno donošenje odluka (CDM – <i>Collaborative Decision-Making</i>);
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- 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;
- 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.

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.

The CAA 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.

2. SAFETY ASSESSMENT PROCESS

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.

- i) aerodromske tehničke instalacije, kao što su napredni sistemi za vođenje i kontrolu kretanja na zemlji (A-SMGCS *Advanced Surface Movement Guidance and Control Systems*) i druga navigaciona sredstva;
- j) prepreke ili aktivnosti koje izazivaju opasnost, na ili u blizini aerodroma;
- k) planirani radovi na izgradnji ili održavanju na ili u blizini aerodroma;
- l) bilo koji lokalni ili regionalni meteorološki uslovi koji mogu izazvati opasnost (npr. smicanje vjetra); i
- m) kompleksnost vazdušnog prostora, struktura ATS ruta i klasifikacija vazdušnog prostora, koji mogu da utiču na promjenu ustaljene šeme odvijanja saobraćaja i kapaciteta vazdušnog prostora.

Nakon završetka sigurnosne procjene, operator aerodroma je odgovoran za implementaciju i periodično praćenje efektivnosti identifikovanih mjera ublažavanja.

ACV razmatra sigurnosne procjene dobijene od strane operatora aerodroma i njenih identifikovanih mjera ublažavanja, operativnih procedura i ograničenja, pri čemu je ACV odgovorna za naknadni regulatorni nadzor primjene istih.

2. PROCES SIGURNOSNE PROCJENE

Sigurnosna procjena se sastoji od četiri osnovna koraka:

- a) definisanja sigurnosnog problema i identifikacije regulatorne usaglašenosti;
- b) identifikacije i analize opasnosti;
- c) procjene rizika i izrade mjera ublažavanja; i
- d) izrade plana implementacije za mjere ublažavanja i zaključka procjene.



2.1. 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 or 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.

If a safety assessment was conducted previously for similar cases in the same context at an aerodrome where similar characteristics and procedures exist, the aerodrome operator may use some elements from that assessment as a basis for the assessment to be conducted. Nevertheless, as each assessment is specific to a particular safety concern at a given aerodrome the suitability for reusing specific elements of an existing assessment is to be carefully evaluated.

2.2. Hazard identification

Hazards related to infrastructure, systems or operational procedures are initially identified using methods such as brain-storming sessions, expert opinions, industry knowledge,

2.1. Definisanje sigurnosnog problema i identifikacija regulatorne usaglašenosti

Svi prepoznati sigurnosni problemi treba da budu detaljno opisani, uključujući vremenske rokove, planirane faze, lokaciju, zainteresovane strane koje su uključene ili pogođene sigurnosnim problemom, kao i njihov potencijalni uticaj u specifičnim procesima, procedurama, sistemima i operacijama.

Prepoznati sigurnosni problem se najprije analizira kako bi se utvrdilo da li predstavlja problem koji može da utiče na sigurnost ili ne. Ako se radi o problemu koji ne utiče na sigurnost, navodi se obrazloženje zašto analizirani problem ne predstavlja sigurnosni problem koje se dokumentuje.

Sprovodi se i dokumentuje početna procjena usaglašenosti sa odgovarajućim odredbama iz propisa primjenljivih na aerodrom.

Odgovarajuće oblasti interesovanja se identifikuju prije nego što se nastavi sa preostalim koracima sigurnosne procjene, sa svim relevantnim zainteresovanim stranama.

Ako je sigurnosna procjena ranije sprovedena u sličnim slučajevima i u istom kontekstu na aerodromu gdje postoje slične karakteristike i procedure, operator može da koristi neke elemente iz te procjene kao osnovu za procjenu koja treba da se sprovede. Međutim, s obzirom na to da je svaka procjena specifična za određene sigurnosne probleme na konkretnom aerodromu, treba pažljivo procijeniti da li su specifični elementi postojeće procjene odgovarajući.

2.2. Identifikacija opasnosti

Opasnosti vezane za infrastrukturu, sisteme ili operativne procedure se početno identifikuju koristeći metode kao što su tzv. *brain-storming* sastanci, mišljenja stručnjaka,



experience and 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.

Following the previous steps, all potential outcomes or consequences for each identified hazard are identified.

The appropriate safety objective for each type of hazard 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 (e.g. identification of a numerical probability) or qualitative terms (e.g. comparison with an existing situation). 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.

2.3. 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 (effect on the safety of the considered operations) and the

znanje iz industrije, iskustvo i operativno rasuđivanje.

Identifikacija opasnosti se sprovodi uzimajući u obzir:

- a) uzročne faktore nesreća i kritične događaje bazirane na jednostavnoj uzročnoj analizi dostupnih baza podataka o nesrećama i ozbiljnim nezgodama;
- b) događaje koji su se možda dogodili u sličnim okolnostima ili su povezani sa naknadno riješenim sličnim sigurnosnim problemima; i
- c) nove potencijalne opasnosti koje su se možda pojavile tokom ili nakon implementacije planiranih promjena.

Nakon prethodnih koraka, identifikovani su svi potencijalni ishodi ili posljedice za svaku pojedinačnu identifikovanu opasnost.

Potrebno je definisati i detaljno opisati odgovarajuće sigurnosne ciljeve za svaki tip opasnosti. Ovo se može postići:

- a) pozivanjem na priznate standarde i/ili kodove prakse;
- b) pozivanjem na sigurnosne performanse postojećeg sistema;
- c) pozivanjem na sličan sistem koji je prihvaćen negdje drugo; i
- d) primjenom eksplicitnih nivoa sigurnosnog rizika.

Sigurnosni ciljevi su navedeni ili u kvantitativnom smislu (npr. identifikacija numeričke vjerovatnoće), ili u kvalitativnom smislu (npr. poređenje sa postojećom situacijom). Izbor sigurnosnog cilja se vrši prema politici operatora aerodroma u odnosu na unapređenje sigurnosti i opravdan je za specifičnu opasnost.

2.3. Procjena rizika i izrada mjera ublažavanja

Nivo rizika za svaku identifikovanu potencijalnu posljedicu se mjeri sprovođenjem procjene rizika. Ovom procjenom rizika će se utvrditi ozbiljnost posljedica (uticaj na sigurnost operacija uzetih u obzir) i vjerovatnoća nastanka



<p>probability of the consequence occurring and will be based on experience as well as on any available data (e.g. accident database, occurrence reports).</p> <p>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.</p> <p>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.</p> <p>Once each hazard has been identified and analysed 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.</p> <p>All risk mitigation measures, whether currently being applied or still under development, are evaluated for the effectiveness of their risk management capabilities.</p> <p>In some cases, a quantitative approach may be possible, and numerical safety objectives can be used. In other instances such as changes to the operational environment or procedures, a qualitative analysis may be more relevant.</p> <p>The safety assessment methodology is provided in Attachment 2 of this Safety Information.</p> <p>In some cases, the result of the risk assessment may be that the safety objectives will be met without any additional specific mitigation measures.</p>	<p>posljedica, i biće zasnovana na iskustvu kao i na bilo kojim raspoloživim podacima (npr. baza podataka o nesrećama, prijave događaja).</p> <p>Razumijevanje rizika je osnova za izradu mjera ublažavanja, operativnih procedura i operativnih ograničenja koja mogu biti potrebna da bi se obezbijedile sigurne aerodromske operacije.</p> <p>Metod procjene rizika u velikoj mjeri zavisi od prirode opasnosti. Sam rizik se procjenjuje na osnovu kombinacije dvije vrijednosti, ozbiljnosti posljedica i vjerovatnoće događaja.</p> <p>Kada je svaka opasnost identifikovana i analizirana u pogledu uzroka i kada je procijenjena sa aspekta ozbiljnosti i vjerovatnoće njenog događanja, mora se utvrditi da se svim povezanim rizicima odgovarajuće upravlja. Prije razvoja bilo koje dodatne mjere ublažavanja, mora se sprovesti početna identifikacija postojećih mjera ublažavanja.</p> <p>Sve mjere ublažavanja rizika, bez obzira da li se primjenjuju ili su još uvijek u fazi izrade, se procjenjuju u odnosu na efektivnost njihovih mogućnosti za upravljanje rizicima.</p> <p>U nekim slučajevima moguć je kvantitativni pristup i mogu se koristiti numerički sigurnosni ciljevi. U drugim slučajevima, kao što su promjene operativnog okruženja ili procedura, može biti relevantnija kvalitativna analiza.</p> <p>Metodologija sigurnosne procjene rizika je data u Prilogu 2 ove Sigurnosne informacije.</p> <p>U nekim slučajevima, rezultat procjene rizika može biti takav da sigurnosni ciljevi budu postignuti bez bilo kakvih dodatnih specifičnih mjera ublažavanja.</p>
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<p>2.4. Development of an implementation plan and conclusion of the assessment</p> <p>The last phase of the safety assessment process is the development of a plan for the implementation of the identified mitigation measures.</p> <p>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.</p> <p>3. APPROVAL OR ACCEPTANCE OF A SAFETY ASSESSMENT</p> <p>The CAA establishes the type of safety assessments that are subject to approval or acceptance and determines the process used for that approval/acceptance. A safety assessment subject to approval or acceptance by the CAA shall be submitted by the aerodrome operator prior to implementation.</p> <p>The CAA analyses the safety assessment and verifies that:</p> <ol style="list-style-type: none"> appropriate coordination has been performed between the concerned stakeholders; the risks have been properly identified and assessed, based on documented arguments (e.g. physical or Human Factors studies, analysis of previous accidents and incidents); the proposed mitigation measures adequately address the risk; and the time frames for planned implementation are acceptable. <p>On completion of the analysis of the safety assessment, the CAA:</p> <ol style="list-style-type: none"> either gives formal approval or acceptance of the safety assessment to the aerodrome operator; 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 	<p>2.4. Izrada plana implementacije i zaključak procjene</p> <p>Posljednji korak procesa sigurnosne procjene je izrada plana implementacije identifikovanih mjera ublažavanja. Plan implementacije sadrži vremenske okvire, odgovornosti za mjere ublažavanja kao i mjere kontrole koje mogu biti definisane i implementirane u cilju praćenja efektivnosti mjera ublažavanja.</p> <p>3. ODOBRENJE ILI PRIHVATANJE SIGURNOSNE PROCJENE</p> <p>ACV uspostavlja tip sigurnosnih procjena koje su predmet odobrenja ili prihvatanja i utvrđuje proces koji se koristi za to odobrenje/prihvatanje. Sigurnosnu procjenu, koja je predmet odobrenja ili prihvatanja od strane ACV-a operator aerodroma mora da dostavi prije početka implementacije.</p> <p>ACV analizira sigurnosnu procjenu i provjerava:</p> <ol style="list-style-type: none"> da li je uspostavljena odgovarajuća koordinacija između svih predmetnih zainteresovanih strana; da li su rizici pravilno identifikovani i procijenjeni, bazirani na dokumentovanim argumentima (npr. studije fizičkih ili ljudskih faktora, analiza prethodnih nesreća i nezgoda); da li predložene mjere ublažavanja adekvatno odgovaraju riziku; i da li su vremenski okviri za planiranu implementaciju prihvatljivi. <p>Po završetku analize sigurnosne procjene, ACV:</p> <ol style="list-style-type: none"> daje operatoru aerodroma formalno odobrenje ili prihvata sigurnosnu procjenu; ili koordinira sa operatorom aerodroma ,ako su neki rizici potcijenjeni ili nijesu identifikovani, u cilju postizanja dogovora o sigurnosnom prihvatanju; ili
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- c) if no agreement can be reached, rejects the proposal for possible resubmission by the aerodrome operator; or
- d) may choose to impose conditional measures to ensure safety.

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

4. PROMULGATION OF SAFETY INFORMATION

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

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.

- c) odbija predlog operatora aerodroma za mogućnost ponovnog podnošenja, ako dogovor ne može da se postigne,; ili
- d) može da nametne uslovne mjere da bi se obezbjedila sigurnost.

ACV treba da osigura da su mjere ublažavanja ili uslovne mjere propisno implementirane i da ispunjavaju svoju svrhu.

4. OBJAVLJIVANJE SIGURNOSNE INFORMACIJE

Operator aerodroma utvrđuje odgovarajući metod za saopštavanje sigurnosnih informacija zainteresovanim stranama i obezbjeđuje da su svi zaključci sigurnosne procjene koji su od značaja za sigurnost saopšteni na odgovarajući način.

Da bi se obezbijedilo adekvatno širenje informacije zainteresovanim stranama, informacija koja utiče na postojeći integrisani vazduhoplovni informacioni paket (IAIP) ili druga relevantna sigurnosna informacija je:

- a) objavljena u odgovarajućoj sekciji IAIP-a ili pružena uslugom automatskih informacija u terminalu (ATIS), i
- b) na odgovarajuće načine objavljena u relevantnim aerodromskim saopštenjima.

**SIGURNOSNA
INFORMACIJA****SAFETY INFORMATION****BROJ: 2017/003 Rev.00****NUMBER: 2017/003 Rev.00**CRNA GORA
AGENCIJA ZA CIVILNO VAZDUHOPLOVSTVO**5. ENTRY INTO FORCE**

This Safety Information shall enter into force on the day of its adoption and publication at the Agency web site.

5. STUPANJE NA SNAGU

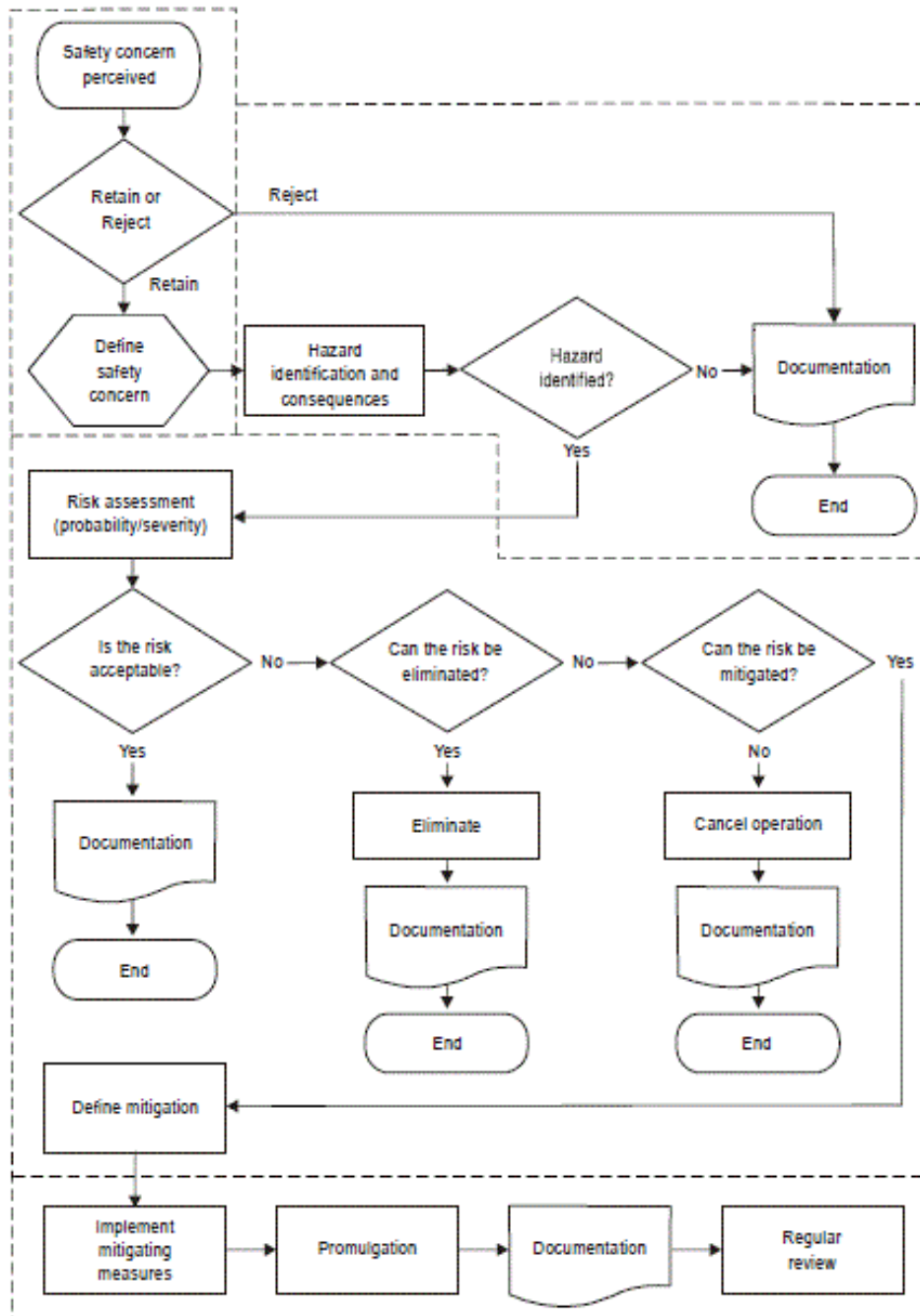
Ova sigurnosna informacija stupa na snagu danom donošenja i objavljuje se na internet stranici Agencije.

Direktor/ Director**Dragan Đurović****Datum / Date****29.12.2017.**



ATTACHMENT 1 / PRILOG 1

SAFETY ASSESSMENT FLOW CHART/ ALGORITAM SPROVOĐENJA SIGURNOSNE PROCJENE





ATTACHMENT 2	PRILOG 2
SAFETY ASSESSMENT METHODOLOGIES FOR AERODROMES	METODOLOGIJE SIGURNOSNE PROCJENE ZA AERODROME
<p>1. Depending on the nature of the risk, three methodologies can be used to evaluate whether it is being appropriately managed:</p> <ul style="list-style-type: none">a) <i>Method type "A"</i>. For certain hazards, the risk assessment strongly depends on specific aeroplane and/or system performance. The risk level is dependent upon aeroplane/system performance (e.g. more accurate navigation capabilities), handling qualities and infrastructure characteristics. Risk assessment, then, can be based on aeroplane/system design and validation, certification, simulation results and accident/incident analysis.b) <i>Method type "B"</i>. For other hazards, risk assessment is not really linked with specific aeroplane and/or system performance but can be derived from existing performance measurements. Risk assessment, then, can be based on statistics (e.g. deviations) from existing operations or on accident analysis; development of generic quantitative risk models can be well adapted.c) <i>Method type "C"</i>. In this case, a "risk assessment study" is not needed. A simple logical argument may be sufficient to specify the infrastructure, system or procedure requirements, without waiting for additional material, e.g. certification results for newly	<p>1. U zavisnosti od prirode rizika, mogu se koristiti tri metodologije da bi se procijenilo da li se njime upravlja na odgovarajući način:</p> <ul style="list-style-type: none">a) <i>Metod tipa „A“</i>. Za određene opasnosti, procjena rizika strogo zavisi od specifičnosti vazduhoplova i/ili performansi sistema. Nivo rizika zavisi od performansi vazduhoplova/sistema (npr. preciznije navigacione mogućnosti), upravljanja kvalitetom i karakteristika infrastrukture. Tada procjena rizika može da se bazira na projektu i validaciji vazduhoplova/sistema, certifikaciji, rezultatima simulacije i analizi nesreća/ozbiljnih nezgoda.b) <i>Metod tipa „B“</i>. Za druge opasnosti, procjena rizika nije stvarno povezana sa performansama specifičnog vazduhoplova i/ili sistema, ali može biti izvedena iz postojećih mjerenja performansi. Tada procjena rizika može da se bazira na statistici (npr. odstupanjima) od postojećih operacija ili na analizi nesreća; izrada generičkih kvantitativnih modela rizika može se dobro prilagoditi.c) <i>Metod tipa „C“</i>. U ovom slučaju, „studija procjene rizika“ nije potrebna. Jednostavan logički argument može biti dovoljan da se odrede zahtjevi koji se odnose na infrastrukturu, sistem ili procedure, bez čekanja dodatnog materijala, npr. rezultati certifikacije za



announced aeroplanes or using statistics from existing aeroplane operations.

Risk assessment method

2. The risk assessment takes into account the probability of occurrence of a hazard and the severity of its consequences; the risk is evaluated by combining the two values for severity and probability of occurrence.
3. Each identified hazard must be classified by probability of occurrence and severity of impact. This process of risk classification will allow the aerodrome to determine the level of risk posed by a particular hazard. The classification of probability and severity refers to potential events.
4. The severity classification includes five classes ranging from "catastrophic" (class A) to "not significant" (class E).
5. The classification of the severity of an event should be based on a "credible case" but not on a "worst case" scenario. A credible case is expected to be possible under reasonable conditions (probable course of events). A worst case may be expected under extreme conditions and combinations of additional and improbable hazards. If worst cases are to be introduced implicitly, it is necessary to estimate appropriate low frequencies.
6. The probability classification includes five classes ranging from "extremely improbable" (class 1) to "frequent" (class 5).
7. The probability classes presented in Table 2 are defined with quantitative limits. It is not the intention to assess frequencies quantitatively; the

nedavno najavljene vazduhoplove ili korišćenje statistika iz postojećih operacija avionima.

Metod procjene rizika

2. Procjena rizika uzima u obzir vjerovatnoću pojavljivanja opasnosti i ozbiljnost njenih posljedica; rizik je procijenjen kombinacijom dvije vrijednosti koje se odnose na ozbiljnost i vjerovatnoću događaja.
3. Svaka identifikovana opasnost mora da se klasifikuje vjerovatnoćom događaja i ozbiljnošću uticaja. Ovaj proces klasifikacije rizika dopušta aerodromu da utvrdi koji nivo rizika predstavlja određena opasnost. Klasifikacija vjerovatnoće i ozbiljnosti odnosi se na potencijalne događaje.
4. Klasifikacija ozbiljnosti uključuje pet klasa rangiranih od „katastrofalne“ (klasa A) do „zanemarljive“ (klasa E).
5. Klasifikacija ozbiljnosti događaja treba da bude bazirana na scenariju koji predstavlja „vjerodostojan slučaj“, a ne na scenariju koji predstavlja „najgori slučaj“. Vjerodostojan slučaj može da se očekuje pod razumnim uslovima (vjerovatni tok događaja). Najgori slučaj može da se očekuje pod eksternim uslovima i kombinacijom dodatnih i rijetko vjerovatnih opasnosti. Ako najgori slučajevi treba da se implicitno uvedu, neophodno je procijeniti njihovu odgovarajuću slabu učestalost.
6. Klasifikacija vjerovatnoće uključuje pet klasa rangiranih od „izuzeto nevjerovatne“ (klasa 1) do „česte“ (klasa 5).
7. Klasifikacija vjerovatnoće prikazana u Tabeli 2 je definisana sa kvantitativnim limitima. Nije



<p>numerical value serves only to clarify the qualitative description and support a consistent expert judgment.</p> <p>8. The classification refers to the probability of events per a period of time. This is reasoned through the following:</p> <ul style="list-style-type: none"> a) many hazards at aerodromes are not directly related to aircraft movements; b) the assessment of hazards occurrence probabilities can be based on expert judgement without any calculations. <p>9. The aim of the matrix is to provide a means of obtaining a safety risk index. The index can be used to determine tolerability of the risk and to enable the prioritization of relevant actions in order to decide about risk acceptance.</p> <p>10. Given that the prioritization is dependent on both probability and severity of the events, the prioritization criteria will be two-dimensional. Three main classes of hazard mitigation priority are defined in Table 3:</p> <ul style="list-style-type: none"> a) hazards with high priority — intolerable; b) hazards with mean priority — tolerable; c) hazards with low priority — acceptable. <p>11. The risk assessment matrix has no fixed limits for tolerability but points to a floating assessment where risks are given risk priority for their risk contribution to aircraft operations. For this reason, the priority classes are intentionally not edged along the probability and severity classes</p>	<p>namjera da se učestalost procijeni kvantitativno; numerička vrijednost služi samo da se razjasni kvalitativni opis i doprinese dosljednoj stručnoj procjeni.</p> <p>8. Klasifikacija se odnosi na vjerovatnoću događaja za neki vremenski period. Ovo je obrazloženo na sljedeći način:</p> <ul style="list-style-type: none"> a) mnoge opasnosti na aerodromima nijesu direktno povezane sa kretanjima vazduhoplova; b) procjena vjerovatnoće pojavljivanja opasnosti može da bude bazirana na procjeni stručnjaka bez bilo kakvih proračuna. <p>9. Cilj matrice je da obezbijedi načine za dobijanje indeksa sigurnosnog rizika. Indeks može da se koristi za utvrđivanje tolerantnosti rizika i uspostavljanje prioriteta relevantnih akcija kako bi se odlučilo o prihvatanju rizika.</p> <p>10. S obzirom da prioritizacija zavisi kako od vjerovatnoće tako i od ozbiljnosti događaja, kriterijumi za prioritizaciju će biti dvodimenzionalni. Tri glavne klase prioriteta ublažavanja opasnosti su definisane u Tabeli 3:</p> <ul style="list-style-type: none"> a) opasnost sa visokim prioritetom — netolerantni; b) opasnost sa značajnim prioritetom — tolerantni; c) opasnost sa niskim prioritetom — prihvatljivi. <p>11. Matrica procjene rizika ne sadrži fiksna ograničenja koja se odnose na tolerantnost, već upućuje na pokretnu procjenu gdje je rizicima dat prioritet u odnosu na njihov uticaj na operacije vazduhoplova. Iz ovog razloga, klase prioriteta namjerno nijesu na ivici duž klasa vjerovatnoća i ozbiljnosti, kako bi se izbjeglo uzimanje u obzir</p>
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in order to take into account the imprecise assessment.

nepreciznih procjena do kojih bi došlo prilikom korišćenja fiksnih vrijednosti tolerantnosti .



Table 1. Severity classification scheme with examples
(adapted from Doc 9859 with aerodrome-specific examples)

<i>Severity</i>	<i>Meaning</i>	<i>Value</i>	<i>Example</i>
Catastrophic	<ul style="list-style-type: none"> – Equipment destroyed – Multiple deaths 	A	<ul style="list-style-type: none"> – collision between aircraft and/or other object during take-off or landing
Hazardous	<ul style="list-style-type: none"> – A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely – Serious injury – Major equipment damage 	B	<ul style="list-style-type: none"> – runway incursion, significant potential for an accident, extreme action to avoid collision – attempted take-off or landing on a closed or engaged runway – take-off/landing incidents, such as undershooting or overrunning
Major	<ul style="list-style-type: none"> – A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency – Serious incident – Injury to persons 	C	<ul style="list-style-type: none"> – runway incursion, ample time and distance (no potential for a collision) – collision with obstacle on apron/parking position (hard collision) – person falling down from height – missed approach with ground contact of the wing ends during the touchdown – large fuel puddle near the aircraft while passengers are on-board
Minor	<ul style="list-style-type: none"> – Nuisance – Operating limitations – Use of emergency procedures – Minor incident 	D	<ul style="list-style-type: none"> – hard braking during landing or taxiing – damage due to jet blast (objects) – expendables are laying around the stands – collision between maintenance vehicles on service road – breakage of drawbar during pushback (damage to the aircraft) – slight excess of maximum take-off weight without safety consequences



			<ul style="list-style-type: none"> – aircraft rolling into passenger bridge with no damage to the aircraft needing immediate repair – forklift that is tilting – complex taxiing instructions/procedures
Negligible	– Few consequences	E	<ul style="list-style-type: none"> – slight increase in braking distance – temporary fencing collapsing because of strong winds – cart losing baggage

Table 2. Probability classification scheme

<i>Probability class</i>		<i>Meaning</i>
5	Frequent	Likely to occur many times (has occurred frequently)
4	Reasonably probable	Likely to occur sometimes (has occurred infrequently)
3	Remote	Unlikely to occur (has occurred rarely)
2	Extremely remote	Very unlikely to occur (not known to have occurred)
1	Extremely improbable	Almost inconceivable that the event will occur



Table 3. Risk assessment matrix with prioritization classes

Risk probability	Risk severity				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent 5	5A	5B	5C	5D	5E
Occasional 4	4A	4B	4C	4D	4E
Remote 3	3A	3B	3C	3D	3E
Improbable 2	2A	2B	2C	2D	2E
Extremely improbable 1	1A	1B	1C	1D	1E