Advisory Circular

CAA-AC-SMS008

July, 2020

GUIDANCE ON SAFETY RISKS AND MITIGATION MEASURES ASSOCIATED WITH THE COVID-19 GLOBAL PANDEMIC

1.0 PURPOSE

1.1 The purpose of this supplementary Advisory Circular is to provide guidance to the industry in the identification of aviation safety risks and mitigation measures associated with the COVID-19 global pandemic. Specifically, this document is intended to support the operators' management systems in identifying the hazards and in establishing mitigations to reduce the associated risks to an acceptable level.

1.2 This is also a supplemental guidance intended to support the safety managers and coordinators in their operational responsibilities in implementing the safety management systems to prepare for return to normal operations through the development of their risk assessment plans.

2.0 REFERENCES

2.1 The Civil Aviation (Safety Management) Regulations, as amended.
2.2 ICAO Safety Management Manual (Doc 9859)
2.3 ICAO Doc 10144, ICAO Handbook for CAAs on the Management of Aviation Safety Risks related to COVID-19.

3.0 INFORMATION AND GUIDANCE

3.1 Based on the prevailing circumstances relating to the COVID 19 global pandemic it is necessary to implement actions in line with the following guidelines:

3.1.1 Adoption of flexible measures on compliance issues such as certifications, licensing, approvals and authorizations without adversely impacting aviation safety and security; and

3.1.2 Implementation of safety management principles for the management of operational risks.

3.2 The application of safety management principles considers identification of safety hazards and the related mitigation measures. It outlines safety related considerations to support safety and operational personnel navigate the pandemic's impact and to help inform decision-making.

Senior management should also promote an integrated approach to safety management and compliance monitoring, supporting a management of change process based on a reliable hazard identification and risk assessment; both activities need to be tailored to the operator's specific operational context.

3.3 The regulator considers that the operator's safety management system (SMS) and compliance monitoring functions play an essential role in managing the risks associated with the gradual recovery of air operations with passengers in the challenging context created by the COVID-19 crisis, and in ensuring a safe return to normal operations.

3.4 While operators strive to resume activities, the COVID-19 crisis has significantly changed their operational context. Regulatory dispensations and alternative means of compliance may have introduced deviations to well-established procedures, and temporary revisions to operations manuals may have been issued under significant time pressure. It is thus important for operators restarting their activities to consider the additional risks that may be introduced.

3.5 In addition, operations during the recovery phase may be affected by several organisational and human factors. Most staff will return to duty with a certain level of psychological stress, and operators should evaluate the need to provide targeted support in specific cases. Front-line staff may not feel "fit" for the duties but be willing to "go the extra mile" in order to support their organisation. Traditional human factor issues, such as distraction, can be exacerbated by COVID-19 related concerns and lead to slips, lapses and mistakes impacting critical actions, such as lowering the landing gear or arming/disarming the door slides. Just culture principles may be at stake, due to fear that in times of crisis, mistakes may be treated as wilful misconduct. These human factors hazards should also be considered in the safety risk management process.

3.6 The safety risk management process is guided in detail in the Advisory circular CAA-AC-SMS-007A.

4.0 IMPLEMENTING SAFETY RISK MANAGEMENT PROCESS

4.1 In order for the industry to identify new and emerging aviation risks resulting from the COVID-19 pandemic, a systematic guidance is provided for consideration of the safety risks and mitigation measures in ***Appendix 1*** for the following areas:

4.1.1 General considerations;
4.1.2 Human factors;
4.1.3 Flight operations;
4.1.4 Airworthiness of Aircraft;
4.1.5 Air traffic services;
4.1.6 Aerodromes and Ground Aids;

4.2 Utilising this methodology, examples of hazards and mitigation measures are provided as a guide.

4.3 **Safety Hazard Identification**

4.3.1 The identification of safety hazards related to the COVID-19 pandemic and the development of the appropriate detailed mitigation measures may be facilitated by the use of a basic Bow Tie tool to capture the information in a more logical and clearer form. This tool is unique in its ability to visualize complex risks in a way that is understandable, and it also enables the creation of detailed and risk-based improvement plans.

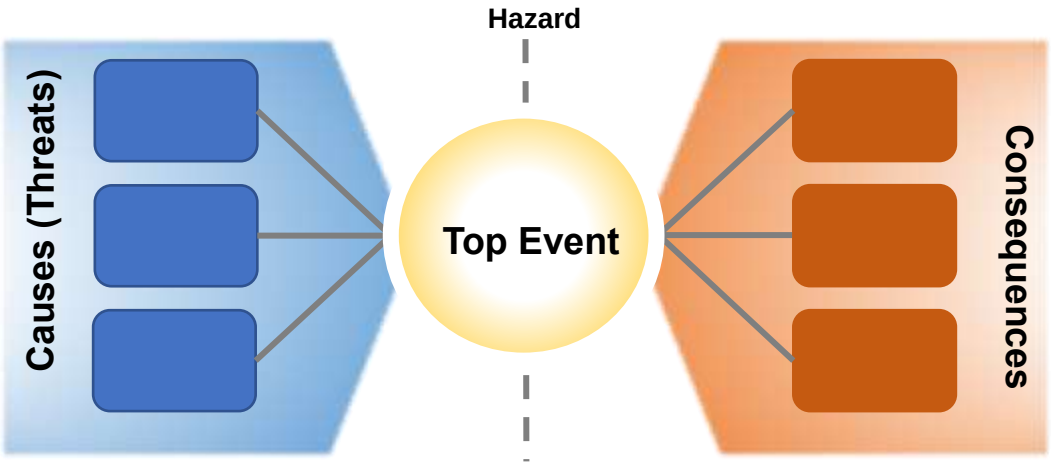


Figure 1: Basic Bow-tie Diagram

4.3.2 Safety managers should brainstorm with their Safety Action Group/Committee/Team members using the relevant guidance for consideration of risks (Appendix 1) to categorize the safety concerns. This process enables the preparation of a preliminary hazard list (PHL). Once the PHL is done, a hazard analysis worksheet or a Bowtie diagram should be made for each hazard so that the safety team can conduct proper analysis.

4.3.3 The following are examples of some of the potential and existing safety hazards arising from the COVID-19 pandemic:

4.3.3.1 Prolonged parking of aircraft and equipment;
4.3.3.2 Redundancy of aviation personnel;
4.3.3.3 Increased wildlife presence on runways/taxiways, etc

4.4 Consequences/Effects

4.4.1 Consequences are events that are caused by the top event. They are the reason why the assesment is done on a hazard in the first place. Consequences are what we ultimately want to prevent, not threats/causes - those are only a problem because they can lead to a consequence.

4.4.2 The following is an example of possible consequences that could arise from the COVID-19 related hazard identified above:

4.4.2.1 Effects of prolonged parking of aircraft and equipment

a) Degradation of aircraft systems and equipment;
b) System and Instruments malfunctioning;
c) Expired calibration of aircraft instruments;
d) External and internal structural damage caused by corrosion; and
e) Unserviceability of aircraft systems.

4.5 **Risk Assessment**

4.5.1 In this step, each hazard's associated safety risk is assessed on a risk matrix based on the severity and likelihood of the outcome. The objective of this step is to determine the acceptability of the safety risk and the level of risk exposure. A risk matrix provides a visual depiction of the safety risk and enables prioritization in the control of the hazards. An example of a Risk assessment worksheet is provided in ***Appendix 2.***

4.6 **Mitigation Measures**

4.6.1 When safety risk is determined to be unacceptable, additional safety risk controls/mitigation (to reduce the safety risk to an acceptable level) must be designed/developed and evaluated. The analysis is conducted to predict the residual risk as if the controls had been put in place. The prediction of the residual risk is assessed to determine if it meets the safety risk acceptance criteria.

4.6.2 Further analysis should be performed to ensure that no new hazards have been introduced or that existing safety risk controls have not been compromised based on the proposed safety risk controls. If the residual risk is not acceptable, the proposed safety risk controls are redesigned or new safety risk controls are developed as necessary and the analysis is reconducted.

4.6.3 The following are examples of mitigation measures that may be adopted for minimizing the effects of the possible consequences highlighted in 3.1.2 above;

4.6.3.1 Support recurrence training aviation of personnel as applicable;

4.6.3.2 Provide guidelines and requirements for corrective maintenance and recalibration of equipment;

4.6.3.3 Provide guidelines for compliance with storage and de-storage of aircraft requirements and procedures, etc

4.7 **Safety Risk Monitoring**

4.7.1 The identified safety risk controls/mitigations require to be monitored to ensure that they achieve their intended safety performance targets. Controls/mitigations should include a methodology for monitoring and tracking the predicted residual risk and assessing the safety risk against defined safety risk acceptance criteria.

5.0 SAFETY RISK MITIGATION PLANS FOR COVID-19

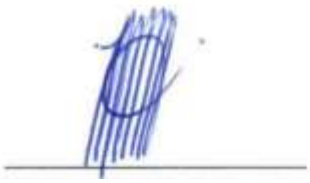
5.1 Service providers are required to develop a safety risk mitigation plan and have it approved by the regulator to demonstrate their alternative means of compliance to Civil Aviation Regulations where they are unable to meet the regulatory requirements. A checklist for submission of the plans is provided in ***Appendix 3.***

5.2 The operator's compliance monitoring function should verify that operations are conducted in accordance with the applicable procedures, as amended in light of the changed operational context, including the implementation of any required mitigating measures in order to achieve the expected safety levels.

5.3 The safety risk mitigation plan should detail the **WHAT, WHY, WHO and HOW**.

	SAFETY RISK MITIGATION PLAN CONTENTS
WHAT	- A list of the regulations the operator is unable to comply with - The type of operations the operator will be conducting

WHY	- Reasons why the regulation cannot be met at the moment e.g unable to access simulator.
WHO	- The affected personnel/process e.g pilots, cabin safety, etc
HOW	- The safety controls/mitigation proposals - Including the proposed length of time that the operator intends to operate under the dispensation with the intention of returning to full compliance with the regulations



CIVIL AVIATION AUTHORITY

Appendix 1:

SAFETY ASPECTS OF REDUCTION/CESSATION OF OPERATIONS

TABLE A: GENERAL

ITEM	SAFETY ASPECTS
1.	Consider system ability to accelerate from a prolonged period of reduced operations
2.	Consider a progressive and coordinated restart of operations
3.	Ensure build-up of activity matches operational context capability
4.	Consider all operations as non-normal and therefore a threat to safety
5.	Ensure cost pressures do not unduly reduce acceptable safety levels
6.	Consider possible culture change as the company or organization goes into financial survival thinking
7.	Ensure sufficient staff available commensurate with the actual level of operations
8.	Ensure continued use of your SMS to its full potential • Carry out a progressive risk analysis prior to re-opening routes.
	• Be aware that risk levels of each flight will change from locality to locality and with each type of operation due to the state of the crisis resolution.
	• Consider the threat of increased risk acceptance (get the job done, less loss of jobs).
	• Consider the risk of missed or reduced safety or quality assurance (audits, etc)
	• Share risk assessments and experiences with other operators
9.	Ensure effective internal and external communication, with all personnel aware of latest procedures and protocols
10.	Ensure continued facility access for staff (i.e., expiry of access badges, pass codes etc.)
11.	Consider staff involvement in process improvement
12.	Consider training • Consider system capacity due to increased demand in the aftermath of a crisis
	• Ensure build-up of activity matches system capability
	• Carry out critical path analysis
	• Use any down time for training and safety education
	• Use all available means for training delivery (video, video conference)
	• Consider training intervals depending on staff experience
13.	Consider opportunities provided by reduction or shutdown of operations • Consider developmental and learning opportunities
	• Revision of processes and regulations
	• Maintenance of aircraft and ground equipment
14.	Ensure contingency plans are available in case of significant staff shortages
15.	Consider team situations • Modify rostering to meet new demands
	• Consider creating non-overlapping teams (social distancing)

16.	Consider IT systems • Ensure critical software and hardware is updated and functional
	• Have a back-up for when IT systems fail
	• Ensure build-up of activity matches system capability
	• Carry out critical path analysis
	• Avoid non-critical software and hardware updates
	• Avoid non-critical software and hardware updates in the early phases of re-establishing operations
17.	Consider intensifying shared safety working across the industry through communication
18.	Consider level of staff turnover
19.	Consider potential for delays or cancellations to planned infrastructure improvements

TABLE B: HUMAN FACTORS

ITEM	**SAFETY ASPECTS**
1.	Consider reduced performance of staff and increased risk in the system due to • Fear
	• Uncertainty about the situation and future
	• Increased stress
	• Increased pressures
	• Distraction
	• Complacency
	• Physiological reasons
	• Psychological reasons
2.	Consider staff support • Activate staff or peer support programs
	• Activate in house human factor managers (if available)
	• Offer safety department for support in safety matters
	• Offer support by human resources department
	• Consider creating a company community for mutual support
	• Consider extending staff support to furloughed or redundant staff
3.	Consider personal relationships between staff retained and those furloughed or made redundant
4.	Ensure awareness of • The mental health state of those people continuing to work
	• The potential for special cases amongst the work force
	• Reduced quality of crew rest
	• Potential reduction in general fitness levels leading to reduced performance

	• The long-term physiological and psychological consequences of the crisis
	• The possibility that staff fearing for their jobs might not behave rationally (decreased reporting, etc)
5.	Ensure just culture policy is known and understood
6.	Ensure staff stay engaged in "company thinking"
7.	Consider impact of loss of routine amongst staff, especially junior staff
8.	Consider ability to ramp teams back to high workload state (normal work)

TABLE C: FLIGHT OPERATIONS

1.	Ensure availability of adequately trained check flight crews
2.	Consider effects of increased pressure on the remaining crews to service the program as more crews isolate
3.	Consider risks from handling aircraft at very light weights (over-speeds, altitude busts, etc.)
4.	Consider altering the limitations on crew if the currency or training is significantly deferred: • limit the number of aircraft types on which a pilot can act as PIC
	• reduction in crew day
	• higher weather minima
	• crew pairing
	• airport selection
5.	Consider weight and balance issues due to unusual load factors • Cabin safety for passenger main decks
	• Consider emergency equipment for carrying cargo in passenger cabins
6.	Consider Dangerous Goods Regulations and policy
7.	Ensure coordination between network planning, flight ops and maintenance when de-storing aircraft
8.	Consider the turn-around and initial report times
9.	Consider processes for roundtrip flights, e.g. rest possibilities, increased crew, food, water and toilet capability, etc
10.	Ensure availability of maintenance at outstations
11.	Consider spare aircraft planning/availability for aircraft on ground at outstation
12.	Consider the available air traffic service level
13.	Consider the availability of en-route and destination diversions
14.	Consider risk analysis and processes for non-normal/non-routine operations, e.g. mixed passenger/cargo
15.	Consider the validity of the following processes • Ensure limited crew exposure during turn around; consider limiting crew walk-arounds
	• Consider limiting access to aircraft by ground staff for non-essential activities
	• Consider availability of transport and hotels
	• Consider management and nature of ferry flights for aircraft positioning

16.	Consider raising crew awareness of last-minute changes to loads, e.g no shows, rebookings from other airlines
17.	Ensure availability of maintenance at outstations
18.	Consider spare aircraft planning/availability for 'aircraft on ground' at outstation
19.	Ensure coordination between network planning, flight ops and maintenance when storing aircraft
20.	Consider management and nature of ferry flights to maintenance bases for aircraft storage
21.	Consider technical flight capability and availability
22.	Consider aircraft storage plan (short, medium, long-term). • Rolling short-term storage may breach AMM
23.	Ensure maintenance plan reflects expected flying rates
24.	Ensure all software, firmware, navigation and terrain databases are up to date
25.	Consider validity of fuel statistics
26.	Ensure that all required ground services are available
27.	Ensure that the fuel service meets regulatory standards
28.	Ensure that the de-icing service meets regulatory standards
29.	Ensure transport back to base for crew having delivered aircraft to maintenance bases for shutdowns

TABLE D: AIRWORTHINESS OF AIRCRAFT

ITEM	SAFETY ASPECTS
1.	Consider increased risk due to the potential for lack of currency • Ensure adequate availability of line maintenance crews to deal with initial bow-wave of defects
2.	Consider skills, experience, knowledge and qualification distribution across shifts • Possible prolonged staff loss due to sickness
3.	Ensure adequate training and documentation for maintenance personnel in de-storage activities
4.	Ensure enough qualified maintenance personnel are available for de-storage of aircraft
5.	Ensure adequate availability of line maintenance crews to deal with initial bow-wave of defects
6.	Consider training and checking requirements and expiry dates
7.	Consider possible reduced availability and timeliness of spare parts
8.	Consider the reliability of 'aircraft on ground' service levels
9.	Consider potential for extended MEL/DDL ops
10.	Ensure coordination between network planning, flight ops and maintenance for immediate availability and storage of aircraft and engines
11.	Ensure coordination between network planning, flight ops and maintenance for de-storage of airplanes and engines
12.	Consider risks arising from long-term parking, including wildlife ingress
13.	Consider the process for de-storage of aircraft and engines
14.	Consider optimization of the maintenance and aircraft component checks
15.	Consider the reliability of 'aircraft on ground' service levels

16.	Consider adverse weather conditions when preparing long-term storage
17.	Consider process for switching from short- to long-term storage
18.	Ensure availability of sufficient equipment for aircraft storage, e.g. covers, plugs etc
19.	Ensure compliance with AMM for aircraft and engine de-storage
20.	Ensure all software, firmware, navigation and terrain databases are up to date
21.	Ensure that all "lifed" or life-limited items are in date
22.	Consider prioritizing calendar requirements
23.	Consider potential for delays in recalibrating tools and equipment
24.	Consider the need for technical flights in light of level and duration of storage
25.	Consider possible ground damage to aircraft during prolonged parking
26.	Ensure compliance with AMM for aircraft and engine shut down and storage
27.	Ensure security of stored aircraft
28.	Check for adequate and suitable parking positions for stored aircraft
29.	Consider potential for delays in recalibrating tools and equipment

TABLE E: AIR TRAFFIC SERVICES

ITEM	SAFETY ASPECTS
1.	Consider increased risk due to the potential for lack of currency
2.	Consider skills, experience, knowledge and qualification distribution across shifts • Possible prolonged staff loss due to sickness
3.	Consider reduced operating hours rather than reduced staffing levels if controller availability is low
4.	Consider training and checking requirements and expiry dates
5.	Consider single point human failure in low staffing situations
6.	Consider simulator refresher training
7.	Consider using different sets of equipment for each shift
8.	Consider availability of medical examiners and potential impact on licensing
9.	Consider confinement of entire shifts (or group of personnel), if necessary, to ensure the continuation of service and to prevent the spread of infection • Organisation: Ensure sufficient food and drinks supplies
10.	Consider capacity imbalances and unusual traffic patterns at regional and/or network level
11.	Consider need to manage increased volume of training flights
12.	Consider threat of increased runway incursions due to procedural drift for returning staff
13.	Consider conflicts/confusion due to unusual ground movements and taxi routes
14.	Consider potential aeronautical information inadequacies due to crisis-related changes or staff shortages
15.	Ensure accuracy, currency and timely transmission of NOTAMs
16.	Consider suspending all routine group training activities
17.	Consider alternative means of training, e.g. remote access
18.	Ensure safety assessments of any traffic pattern changes are performed

19.	Consider establishing crisis information flow channels with adjacent ATC units, airports in your airspace and emergency services
20.	Consider sectorisation plans
21.	Consider existing procedures and 'Letters of Agreement'
22.	Consider development of plans in case adjacent ATC units close down
23.	Ensure regular risk analyses conducted
24.	Consider preparation of a service recovery plan
25.	Consider work in extended teams (an extra pair of eyes) as traffic levels increase
26.	Ensure adequate availability of qualified manpower for technical resilience
27.	Consider limiting maintenance activities to essential tasks
28.	Ensure availability and maintenance of a spare ops room and remote/mobile towers
29.	Consider only essential maintenance activities should be carried out
30.	Ensure availability and maintenance of a spare ops room and remote/mobile towers
31.	Ensure all equipment is up to date and functioning
32.	Consider equipment resources required to support new working patterns
33.	Consider unexpected behaviour of decision-support tools due to unusual traffic patterns
34.	Consider flight plan inconsistencies due to multiple AIRAC changes
35.	Consider potential increase in airspace infringements due to lack of general aviation traffic pilot recency

TABLE F: AIRPORTS

ITEM	SAFETY ASPECTS
1.	Consider increased risk due to the potential for lack of currency
2.	Consider skills, experience, knowledge and qualification distribution across shifts • Possible prolonged staff loss due to sickness
3.	Consider risk of airside staff complacency due to growing activity levels
4.	Consider risk of airside staff complacency due to reduced ramp activity levels
5.	Consider risk of staff work overload due to growing activity levels
6.	Consider risk of returning/current staff inability to perform their duties due to pandemic-related restrictions
7.	Consider potential for increased numbers of disruptive passengers
8.	Consider risk from staff working in unfamiliar or non-standard locations
9.	Ensure accuracy, currency and timely transmission of NOTAMs
10.	Ensure maintenance of active wildlife control measures
11.	Ensure that all the equipment and airport surfaces are in safe condition
12.	Consider reduced or changed runway/taxiway availability due to parked aircraft
13.	Consider airport security provision • Limitations in security provision resulting in an in-flight security incident
	• Providers at high/moderate risk destinations not ready to operate
	• Variable degradation of facilities and service provision
14.	Consider risk of deviations from regulatory and/or organizational requirements, policies and procedures

15.	Ensure all services (e.g. fuel, de-icing, water) meet regulatory standards
16.	Consider efficiency of emergency response due to lack of exercises, parked aircraft, obstructed access roads, staff availability
17.	Ensure sufficient provision of ground handling services such as toilet cleaning and galley replenishment
18.	Ensure that the airfield has a master parking plan and that standard and crisis level capacity are known
19.	Consider potential risk from blocked runway/taxiway due to parked aircraft
20.	Ensure that the airfield has a master parking plan and that standard and crisis level capacity are known
21.	Consider requirement to keep aerodrome facilities and services operational and certified
22.	Consider potential for surface damage from long-term parking of aircraft
23.	Consider possible ground damage to aircraft during increase of ground activities
24.	Consider likelihood of delays or cancellations to planned infrastructure improvements
25.	Ensure that sufficient engine running capability exists
26.	Ensure proper management of fuel in tanks, vehicles and feeder lines
27.	Ensure proper management of potable water supplies
28.	Ensure proper management of de-icing fluids
29.	Ensure all delivery and storage equipment (e.g. fuel, de-icing, water) meets regulatory standards
30.	Ensure that sufficient engine running capability exists

Appendix 2

EXAMPLE OF A SAFETY RISK ASSESMENT WORKSHEET

Event	Risk Description	Hazard related Consequence	Initial Risk Factor	Risk Controls	Further Mitigations	Residual Risk	Owner
Use of sanitizer for disinfection of aircraft	high alcohol content in sanitizers that is highly flammable	cockpit/engine fires	20	Sanitizer bottles carried by crew shouldn't exceed 50ml alcohol content shouldn't exceed 75%	time interval between disinfection and engine start-up	10	
classrooms for conducting training	spread of Covid19 due to enclosed space	Infection/spread of Covid19	15	- seats arranged 1.5m apart - Windows and doors kept open during classes for circulation of air - Fumigation of classrooms after every class session		6	

Appendix 3

SAFETY RISK MITIGATION PLAN - SUBMISSION CHECKLIST

Safety Risk Mitigation Plan - Submission checklist
A Safety Risk Mitigation Plan MUST describe the WHAT WHY WHO and HOW. The following should be addressed as a minimum: 1) A list of the exempted regulation provisions the operator would like relief from. ☐ 2) A list of other regulatory provisions you would like COVID-19 relief from. ☐ 3) The type of operations the operator will be conducting under the exemption. ☐ 4) The number of operating personnel/crew that will continue operation under the exemption. ☐ 5) The proposed length of time that the operator intends to operate under the exemption. ☐ 6) The alternative training/tests/checks that the operating personnel will need to complete to ensure competency, and how the training and those tests and checks will be conducted (this will include syllabus of training and check profiles). ☐ 7) A risk assessment that addresses each provision of the COVID-19 exempted operations to show how risks have been identified and mitigated to as low as reasonably practical. ☐ 8) A return to normal operations plan that demonstrates how the operator will return to full compliance with the regulations prior to the expiry of the exemption ☐ **Your Safety Risk Mitigation Plan MUST be version controlled by version number and date.**
Attach relevant information

Accountable Manager Declaration

I declare that:

- All statements in this application are true and correct in every particular and that I have read and understood all provisions of the Kenya Civil Aviation Regulations 2018 which are relevant to this application.
- I understand KCAA will use the currently held details to process this application and it is my responsibility to ensure my details are correct prior to lodgment.
- I have attached all required documentation specified in the application/ notification/authority checklist.

Full name	……	SIGN	……	Date	……