

HEALTH SAFETY MEASURES TO MITIGATE RISK OF COVID-19 IN AVIATION

Revision 1
28 December 2020

Revision History

Revision	Publication date	Details
Initial issue	23 October 2020	-
1	28 December 2020	The key changes in this revision pertain to updates to the various measures that the airport operator is required to take in Chapters 4 and 5. Editorial amendments are made in other chapters.

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1 Background

COVID-19 has caused unprecedented severe disruption to air travel globally. Border restrictions, lockdowns and health measures have been introduced in many States to fight the pandemic.

During this challenging period, our air operators, airport operator and air navigation service provider continue to support air services to bring in essential supplies and enable Singapore residents and travellers to return home. Singapore has moved to the next phase of preparing the industry for recovery of air travel in a coordinated and safe manner. Aviation safety and the safety of travellers and aviation workers remain a top priority.

The Civil Aviation Authority of Singapore (CAAS) works closely with Ministry of Transport (MOT) and Ministry of Health (MOH), in partnership with aviation industry partners, to develop and implement health safety measures to safeguard public health and the well-being of passengers, air crew, airport visitors and staff.

This document is a compendium of measures applicable to the airport operator, air operators and other providers of airport services and facilities at Changi Airport and Seletar Airport, covering all phases of an air transport journey. The measures contained in this document incorporate existing requirements as well as guidance issued by CAAS, based on international and observed best practices. In addition, reference may also be made to the guidance (*Take-off: Guidance for Air Travel Through the COVID-19 Public Health Crisis*) published by the International Civil Aviation Organization (ICAO) for further aviation health safety measures to be implemented.

This document is regularly reviewed to consider emerging issues or new developments in the COVID-19 situation. It is not intended to displace or prevail over any written law in Singapore, or any Directives, Directions, Circulars or similar documents issued by CAAS in respect of any matter relating to health safety measures to mitigate risk of COVID-19 in aviation .

2 Overview

This document consolidates the requirements as well as recommendations to address risk of COVID-19 infection in the context of aviation operations. For clarity, the word “must” is used in relation to requirements, whereas “should” and “may” denote recommendations or guidance.

The recommendations contained in this document should be considered for implementation by permitted enterprises (as defined in the COVID-19 (Temporary Measures) (Control Order) Regulations 2020) (“Control Order Regulations”) operating at Changi Airport and Seletar Airport (collectively referred to as “airport”) that provide airport services and facilities essential for the safe and efficient conduct of air travel operations, such as the airport operator, Singapore and foreign air operators, the airport hotels and ground handling agents and other service providers. To avoid doubt, retail and F&B establishments are not covered by this document, although they may be subject to the Control Order Regulations.

The document consists of five sections, as follows:

- (a) *Implementation plans for measures* – This section provides guidance for permitted enterprises to develop plans to mitigate the risk of COVID-19 in aviation to facilitate the recovery of air travel.
- (b) *General mitigation measures* – This section contains measures to be put in place by permitted enterprises in accordance with the Control Order Regulations that are applicable to airport staff, air crew, passengers or airport visitors within the premises of the airport.
- (c) *Airport measures* – This section contains the safe management measures applicable to the airport operator to adopt and implement, which include use of masks, safe distancing, routine sanitisation of areas such as the check-in areas, border control areas and baggage claim areas, temperature screening, and public communications. This section also includes measures on passenger management at various touchpoints within the airport premises, including at check-in and immigration clearance.
- (d) *Aircraft measures* – This section contains the health measures pertaining to aircraft, including the management of passengers before and during flight, and the cleaning and disinfection of the aircraft before, during and after flight. This section applies to air operators and airport operators.
- (e) *Crew measures* – This section contains the measures to protect air crew, which include crew reporting for duty, crew-to-crew interaction while on duty on board the aircraft, and layover procedures. This section applies to air operators.

3 Implementation Plans for Measures

3.1 Objective

This section provides guidance to permitted enterprises on developing plans to mitigate the risk of COVID-19 in aviation to facilitate the recovery of air travel.

3.2 Developing Implementation Plans

There are three main phases to developing plans in preparing the industry for recovery of air travel, as discussed in the following paragraphs.

3.2.1 Identifying and implementing the necessary measures

A permitted enterprise should:

- (a) identify its responsibilities and the applicable measures it must implement from Sections 4 to 7 on general mitigation, airport, aircraft and crew;
- (b) identify the collaboration required with other parties responsible, if applicable;
- (c) identify the resources needed and the equivalent alternatives, if resources are limited;
- (d) identify the areas which will require more resources downstream and for which expansion or optimisation of existing resources is needed;
- (e) identify the potential implementation issues that may arise from operational or practical needs and implement adequate mitigating measures;
- (f) identify the monitoring mechanisms to check the efficacy of the measures and implementation;
- (g) determine the level of service that can be provided and assess the acceptability of such level of service from relevant perspectives; and
- (h) implement the applicable measures and fulfil its responsibilities identified from Sections 4 to 7 relating to general mitigation, airport, aircraft and crew in a timely manner.

3.2.2 Training and communication

A permitted enterprise should:

- (a) communicate to all staff the measures and responsibilities that are specific to their roles;
- (b) establish procedures and provide training to them on these measures and responsibilities; and
- (c) communicate to the public including passengers, where appropriate, on the measures taken and highlight the need for all to play a part in the enhancing the effectiveness of these measures.

3.2.3 Implementation and continuous monitoring

A permitted enterprise should:

- (a) share data and information with the relevant stakeholders to identify and anticipate the potential areas of concern;
- (b) share ideas and suggestions with the relevant stakeholders to address potential areas of concern; and

- (c) establish a means to perform continuous monitoring, e.g. through conducting ground checks to ensure that the implemented measures are working to meet the intent of the measures.

4 General Mitigating Measures

4.1 Objective

The [Control Order Regulations](#) set out the safe management measures to be implemented by permitted enterprises in Singapore. Each permitted enterprise operating at the airport is responsible for ensuring that the measures are adhered to by their staff, passengers, and other customers and airport visitors where applicable. This Section summarises the key measures that must be implemented in accordance with the Control Order Regulations.

4.2 Mask Covering and Other Protection

A permitted enterprise must ensure that every individual within its premises wears a mask at all times except as otherwise provided in the Control Order Regulations.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

A “mask” means any paper, plastic or textile covering solely designed or made to be worn over the nose and mouth to provide the wearer protection against infections or air pollution, but excludes a face shield. Face coverings such as neck gaiters, bandanas, scarves or handkerchiefs are not considered masks.

The mask must be worn over and cover the wearer’s nose and mouth, with the mask touching the wearer’s nose and cheeks.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

A face shield may be used in lieu of a mask if the individual is 12 years of age or younger, or if wearing a mask over the person’s nose and mouth leads to severe medical conditions for the individual and wearing a face shield does not. Spit guards predominantly cover the mouth and are not considered face shields or masks.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

4.3 Safe Distancing

A permitted enterprise must ensure and maintain safe distancing among individuals within its premises in the airport.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

4.4 Sanitisation and Disinfection

A permitted enterprise must ensure that high-touch places and surfaces within its premises in the airport are cleaned and disinfected regularly.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

4.5 Minimising Interaction

A permitted enterprise must, as far as is reasonably practicable, ensure that physical interaction between individuals in its premises is minimised.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

4.6 Communications

A permitted enterprise must, as far as is reasonably practicable, communicate to its staff and all individuals in its premises at the airport the safe management measures mentioned in paragraphs 4.2 to 4.5, that apply to them.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

4.7 Monitoring and Conduct of Risk Analysis

A permitted enterprise must:

- (a) monitor and regularly assess and identify the risks of transmission of COVID-19 in its premises at the airport that may arise in relation to its activities, that passengers, customers, visitors, or its staff engage in; and
- (b) establish and apply the necessary policies, procedures and controls to mitigate that risks of transmission of COVID-19.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

5 Airport Measures

5.1 Objective

This section on airport measures contains the precautionary measures to be implemented by permitted enterprises at the airport to reduce the public health risks to passengers, air crew, airport visitors and staff.

5.2 General Measures

5.2.1 Use of masks

The airport operator should work with relevant permitted enterprises to make face masks available at the airport for purchase.

5.2.2 Safe Distancing

In waiting areas or areas where people are likely to gather or queues are likely to form, e.g. check-in counters, security screening areas, immigration counters, gate hold rooms, aerobridges during embarkation and disembarkation, designated Transfer Holding Areas (THAs), transit hotels, Inadmissible Persons (IP) Room, swabbing stations, baggage claim halls and ground transport boarding area, the airport operator must ensure that safe distancing is observed between individuals or groups of individuals.

The ground staff from the airport community in operational areas should keep a look out for non-compliance in safe distancing and remind passengers and visitors accordingly.

5.2.3 Ensuring Cleanliness

The airport operator should ensure that high-touch surfaces such as door handles, counter tops, baggage equipment and lift buttons are cleaned and disinfected frequently. For added layer of protection, these surfaces should be coated with a protective long-lasting antimicrobial coating to reduce the risk of virus transmission.

Cleaning and disinfection of toilets should be stepped up throughout the day, with autonomous cleaning and disinfecting equipment. In addition, sufficient hand sanitisers should be made available and easily accessible throughout the airport.

5.2.4 Contactless Touchpoints

The airport operator should deploy technological solutions to encourage contactless touchpoints as far as practicable.

5.2.5 Communications

A permitted enterprise must, as far as is reasonably practicable, communicate to all its staff and all other individuals the safe management measures that are implemented within its permitted premises that apply to them.

COVID-19
(Temporary
Measures)
(Control Order)
Regulations 2020

The airport operator must provide important public health notices from the relevant authorities at key airport touchpoints through means such as notices, signages or public announcements. The airport operator should also take other actions including issuing reminders, advisories and circulars on safe management measures (such as safe distancing and wearing of masks) to all individuals through appropriate means throughout the airport.

5.2.6 Staff Protection

The airport operator must provide suitable furniture (such as protective screens) to ensure safe distancing and suitable equipment at touchpoints where there is frequent contact between airport staff and visitors/passengers (such as check-in counters and other manned counters to protect visitors/passengers and airport staff).

The airport operator must require all airport staff who come into close contact with passengers from high risk countries or regions, and who are tasked to do cleaning of the toilets, to wear full Personal Protective Equipment (PPE) comprising surgical mask, face shield or goggles, gloves, shoe covers and medical gown. The airport operator must establish and communicate to airport staff the guidelines for the use and disposal after use of PPE based on guidelines issued by health authorities especially for the handling of symptomatic cases.

The airport operator must ensure that common-use equipment such as computers, tablets, headsets, etc. are disinfected in between users. For staff working in shifts, handovers should be conducted in a contact-free manner (e.g. via telephone, video-conference, electronic logs), or at a minimum using safe distancing arrangements.

5.2.7 Contact Tracing

Permitted enterprises within the airport must implement the national digital entry system, i.e. SafeEntry and/or TraceTogether, where applicable, that allows individuals to register their particulars when entering their permitted premises, to facilitate contact tracing when needed. The airport operator must also take all practicable steps to ensure that any individual entering a shop, including those within the transit areas of Changi Airport terminals, register their particulars before entering.

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Requirements for
Safe
Management
Measures at the
workplace

The airport operator must require airport staff to use the TraceTogether mobile application or token to check in before entering the transit area.

Permitted enterprises must also provide information to the government and other public agencies, when requested, to facilitate contact tracing if an airport staff, crew, passenger or visitor is found to be COVID-19 positive.

5.3 Check-in Area

The airport operator should work with the air operators to advise passengers to travel light and to minimise the amount of hand-carry luggage. All luggage should be checked-in except for small hand luggage that can fit under an

aircraft seat to reduce movement and interaction between crew members and passengers while on board the aircraft.

Where reasonably practicable, the airport operator should work with air operators to implement measures to facilitate and encourage passengers' use of online or self-check-in procedures, including the use of automated check-in kiosks and bag drop machines to minimise contact with airport staff. To further facilitate safe distancing, there should be demarcations for every alternate equipment or machines not to be used.

5.4 Arrival Immigration

All passengers and crew members must each submit an electronic health declaration before entry into Singapore and may do so up to three (3) days prior to arrival in Singapore.

[Circular 2020/23](#)

An air operator should encourage passengers to submit their electronic health declaration before departing for Singapore, e.g. at check-in or before boarding. The airport operator should provide clear signage encouraging arriving passengers to submit their electronic health declarations before proceeding to the arrival immigration halls, to avoid delays in processing and crowding at the halls.

5.5 Terminal Airside Area

5.5.1 Border Screening

The airport operator should support the health authority and air operators in carrying out border screening measures to detect symptomatic passengers and refer such passengers for further assessment. An air operator may also implement additional measures in accordance with its own policies or destination requirements.

For example, the airport operator should ensure that airport staff are allowed entry into the transit area only after undergoing temperature checks and are not found to be febrile. Anyone who is found to be febrile should be referred to a doctor on duty.

When the use of thermal cameras is employed, the airport operator should ensure that these cameras are contactless and are set up at appropriate locations to minimise the interaction between passengers and healthcare assistants during temperature screening. Any passenger who is detected to be febrile or symptomatic should be directed to a health screening station for further assessment.

5.6 Baggage Claim Area

The airport operator and ground handlers should provide a speedy baggage claim process and ensure that passengers' time in the baggage claim area is minimised.

The airport operator and air operators should, as far as practicable, make available self-service kiosks or online options for passengers to report lost or

damaged luggage to reduce waiting time in the baggage claim area and the need for human interaction.

5.7 Managing Unwell or Symptomatic Passengers in the Airport

At the border screening for arriving passengers, upon detection of febrile or symptomatic passenger, the health authority or its contracted screening staff must refer the passenger to the health screening station for further assessment. The airport operator should designate areas in the airport to isolate unwell passengers while awaiting medical attention.

The airport operator should manage and dispose of all waste materials that were in direct contact with the unwell passenger appropriately. These include partially consumed meals, beverages and disposable items such as used paper towels, tissues and PPE produced while treating or supporting the unwell passenger.

6 Aircraft Measures

6.1 Objective

This section on aircraft measures contains the precautionary measures to be implemented by air operators to minimise the public health risks in the aircraft.

6.2 General

6.2.1 Communications

An air operator must communicate to its crew the safe management measures set out in Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020 that apply to the crew.

6.2.2 Monitoring and Conduct of Risk Analysis

An air operator should monitor and regularly assess and identify the risks of transmission of COVID-19 in the aircraft. The air operator should also establish and apply the necessary policies, procedures and controls to mitigate the risks.

6.3 Passenger Management

6.3.1 Pre-Boarding

An air operator must, before operating a flight —

- (a) conduct a basic health assessment of each passenger before he or she boards the aircraft for the flight to or from Singapore, which must include asking the following questions:
 - (i) Do you have any of the following symptoms: fever, cough, runny nose, sore throat, anosmia or shortness of breath?
 - (ii) Are you diagnosed or suspected to have COVID-19 infection in the last 21 days?
 - (iii) Did you have close contact with any case of COVID-19 in the last 14 days?
- (b) take the passenger's temperature before he or she boards the aircraft for the flight to Singapore, unless the air operator is satisfied that the facilities and arrangements provided for temperature screening of departing passengers at the departure airport would detect a febrile passenger; and
- (c) not board any passenger who:
 - (i) has a fever with a temperature 37.5°C or higher;
 - (ii) has indicated "YES" to any of the questions above; or
 - (iii) displays any of the COVID-19 symptoms.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

Departing passengers who are found to be febrile must not be allowed to access the airport transit areas. Such passengers are to be referred to a doctor on duty or at a clinic in the airport to be assessed on their fit-to-fly status.

An air operator may rely on temperature screening carried out by an airport operator or government agency at the airport, instead of taking the passenger's temperature itself, if it is satisfied that the temperature screening meets the intent of Directives No. 9/2020 (as amended by Amendment No.1) or 10/2020.

An air operator and the airport operator should work together to review and implement operational processes and procedures to achieve safe distancing and avoid the crowding of passengers in the gate hold room, aerobridge or buses and on board the aircraft. Such procedures may include opening the boarding gate earlier and implementing queue management systems.

6.3.2 On board the aircraft

An air operator must ensure that every passenger on board the aircraft wears a mask, unless he or she:

- (a) is less than 6 years old;
- (b) has breathing difficulties;
- (c) is unconscious;
- (d) is unable to remove a mask without assistance;
- (e) is eating, drinking or taking oral medication; or
- (f) is removing the mask under a crew member's direction.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

The air operator must also ensure that each passenger observes safe distancing measures when not seated on board the aircraft, including when queuing to use a lavatory.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

An air operator must ensure that the amount of interaction between crew members and passengers is minimised, and that meal or beverage services not provided unless necessary.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

An air operator should provide guidance to passengers regarding the application of on-board preventive measures, including hand hygiene, respiratory etiquette and use of masks. Seatback literature for selected cabins should be removed where practicable while inflight sales and hot towel service should be suspended.

An air operator should highlight to passengers, through its safety demonstrations or through other appropriate means, that they should remove their masks before donning emergency oxygen masks, should they be needed. Passengers should also be reminded to dispose their used masks properly.

An air operator must also ensure that a passenger's request to change his or her seat be accommodated, where practicable, if the passenger has preference for safe distancing.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

As all passengers and crew members must submit an electronic health declaration before entry into Singapore, an air operator should ensure that in-flight announcements are made to advise all passengers to complete the form before proceeding to arrival immigration, to avoid delays in processing and crowding at the arrival immigration halls.

Circular 2020/23

An air operator should provide contact information of passengers that resides within its records, to authorities when requested to facilitate contact tracing when a passenger is tested COVID-19 positive.

6.3.3 *Managing unwell passengers on board the aircraft during flight*

An air operator must designate the last three (3) rows of seats, on either the left or the right side of the cabin, as an emergency quarantine area. The air operator must also require cabin crew to monitor passengers in order to identify any passenger who appears to be showing COVID-19 symptoms during the flight, including taking the passenger's temperature during flight, if necessary, to check for fever.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

If a passenger becomes unwell and shows any COVID-19 symptoms during a flight, the air operator must:

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

- (a) isolate and seat the unwell passenger in the emergency quarantine area;
- (b) ensure that the unwell passenger wears a mask if his or her condition permits;
- (c) reserve the lavatory closest to the emergency quarantine area for exclusive use by the unwell passenger;
- (d) arrange for the unwell passenger to receive medical attention upon landing; and
- (e) allow the unwell passenger to disembark only after all other passengers have disembarked, unless the unwell passenger needs urgent medical attention.

An air operator should manage and dispose of all waste materials that were in direct contact with the unwell passenger or crew appropriately. These include partially consumed meals, beverages and disposable items such as used paper towels, tissues and PPE produced while treating or supporting the unwell passenger or crew.

6.3.4 *Disembarkation*

An air operator should, in coordination with airport operators, implement measures for disembarkation process to achieve safe distancing and avoid crowding of passengers on board the aircraft, such as disembarking passengers by rows and making announcements to guide them accordingly.

6.4 **Aircraft Cleaning and Disinfection**

6.4.1 *General principles and guidelines*

An air operator must use only cleaning agents, disinfectants or other materials known to be effective against COVID-19 and suitable for aviation use (e.g. Calla 1452) and adhere to the aircraft or equipment manufacturer's

Directives No. 9/2020 (as amended by Amendment

instructions on the choice of cleaning agent or disinfectant, and the proper application of these cleaning agents and disinfectants.

| When choosing a cleaning agent or disinfectant, an air operator should ascertain that its application is not likely to have damaging effects on human health; or on aircraft electronics, avionics, aircraft structure, cabin interiors, and sensors.

| An air operator should ensure that adequate training is provided to persons performing the cleaning and disinfecting tasks and establish procedures to guide personnel cleaning or disinfecting the aircraft. These procedures should include at least the following:

- (a) having such persons wear appropriate personal protective equipment (PPE) such as masks, goggles and/or gloves while carrying out the cleaning and disinfecting tasks;
- (b) ensuring adequate ventilation while working in confined areas such as lavatories;
- (c) designating persons to:
 - (i) clean or disinfect designated sections of the aircraft to prevent cross-contamination of cleaning areas; or
 - (ii) perform specific tasks to clean or disinfect the aircraft to prevent cross-contamination of cleaning equipment;
- (d) minimising occupational health and safety risks that a person may face when cleaning or disinfecting aircraft; and
- (e) proper removal of PPE after completion of the cleaning or disinfecting tasks.

| An air operator should ensure that persons cleaning or disinfecting the aircraft carry out the following after the tasks are completed:

- (a) disinfect their gloves before removing them;
- (b) disinfect their hands after removing their gloves and their protective suits (if worn);
- (c) remove their face shields and/or goggles (if worn) only after (a) and (b) are carried out; and
- (d) clean their hands and other parts of their body that may have been exposed to contaminants with soap and water or with an alcohol-based sanitiser.

Note: Persons carrying out cleaning or disinfecting tasks should avoid touching their faces with gloved or unwashed hands.

| Given the increased frequency of disinfection due to COVID-19, an air operator should periodically inspect the aircraft equipment to ensure that there are no long-term effects or damage over time. If damage is observed, the air operator should contact the manufacturer for guidance on alternate cleaning agents or disinfectants, and safety actions if necessary.

| An air operator should establish and implement procedures to verify the correct positioning of control handles, circuit breakers, control panels switches and knobs in the flight deck and cabin after cleaning or disinfecting.

6.4.2 Routine cleaning

An air operator should make the necessary arrangements to clean areas commonly touched by passengers (such as meal trays, inflight seat monitors, seat arm rests, window shade covers, overhead bins and lavatory door handles) at every transit or at a frequency based on the air operator's own risk assessment. This risk assessment should take into account the risk profile of the route(s) operated by the aircraft with respect to COVID-19 and the duration of the disinfecting effects of the substance used.

Where the aircraft turnaround time permits, the air operator should also clean the lavatories and areas in the cabin that are commonly touched by crew (such as galleys and crew seats).

6.4.3 Preventive cleaning and disinfecting

In addition to the routine cleaning in 6.4.2, a Singapore air operator should also disinfect areas in the cabin that are commonly touched by passengers and crew (such as galleys, overhead bins, lavatories and cabin crew rest compartments) at every base layover in Singapore or at a higher frequency based on the operator's risk assessment. Such a risk assessment should take into account the risk profile of the route(s) operated by the aircraft and the duration of the disinfecting effects of the substance used.

A foreign air operator should also consider similarly disinfecting the cabin of its aircraft during its base layover at its home base, or at a higher frequency based on the operator's risk assessment.

A Singapore air operator should also clean and disinfect the flight deck, which may be at a different frequency from the cabin, taking into account any separation between the flight deck and cabin.

As there are numerous sensitive equipment in the flight crew compartment, a person who carries out cleaning and disinfecting the cockpit should be appropriately trained to prevent inadvertent damage to or adjustments of settings of this equipment.

6.4.4 Disinfection of the cabin after carriage of unwell persons

In the case where there was an unwell crew or passenger showing any COVID-19 symptoms on board the aircraft, the air operator must disinfect, or cause to be disinfected, the affected areas of the aircraft cabin using materials known to be effective against COVID-19 and suitable for aviation immediately after the flight (e.g. Calla 1452).

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

If there is any contamination of the cabin areas or surfaces with body fluids or secretions (e.g. vomitus or mucus), the air operator should, before the next flight:

- (a) remove the excess contaminants from the overly contaminated areas or surfaces by using an absorbent material or absorbent disinfectant;
- (b) ensure that the excess contaminant be solidified;
- (c) dispose the absorbent material or disinfectant appropriately;
- (d) treat the contaminated areas or surfaces with disinfectant;

- (e) remove contaminated carpet and/or seat covers and place them in a sealed plastic bag labelled as “bio-hazard”;
- (f) launder the carpet and/or seat cover in accordance with manufacturer’s recommendations, or where laundering is not possible, to dispose of the contaminated carpet and/or seat cover appropriately; and
- (g) remove the underlying upholstery and carry out disinfection, in the case where the contaminants have penetrated the seat cover.

An air operator may use the following cleaning and disinfection process:

- (a) after all the passengers and crew have disembarked, close the cabin doors and adjust the air-conditioning system to maximum airflow until there is a complete exchange of air in the cabin;
- (b) disinfect the sitting area of the unwell person;
- (c) clean thoroughly all the seats within a two-metre radius of the unwell person, including:
 - (i) armrests;
 - (ii) seatbacks;
 - (iii) tray tables;
 - (iv) seat belt buckles;
 - (v) light and air ventilation controls;
 - (vi) cabin crew call buttons;
 - (vii) overhead compartment handles;
 - (viii) sidewall panels, windows and window shades;
 - (ix) portable electronic devices provided to the passenger; and
 - (x) individual video monitors, touchscreens and remote controls;
 - (xi) oxygen masks, if used;
- (d) disinfect and thoroughly clean the lavatory that had been designated for the use of the unwell person, including:
 - (i) door handles;
 - (ii) locking devices;
 - (iii) toilet seat;
 - (iv) faucet;
 - (v) basin; and
 - (vi) sidewall panels.

The air conditioner should be turned off during the disinfection operation, and the passenger cabin should be fully ventilated after disinfection.

6.4.5 High-efficiency particulate air (HEPA) filters

An air operator should ensure that the aircraft is equipped with HEPA filters to remove microbes from the cabin air and avoid introducing unfiltered air (e.g. external preconditioned air at the aerobridge) into the aircraft cabin.

Before the boarding process, an air operator should ensure that filtered air has been introduced adequately, e.g. by running the aircon packs with the HEPA filters for at least 10 minutes before the boarding process.

6.4.6 Cabin air circulation

An air operator should use the air conditioning packs installed with HEPA filters in recirculation mode as much as possible. This aims to ensure continuous air circulation in the cabin and refreshing air to every 2-3 minutes throughout the flight. If the aircraft in-flight operating procedure calls for packs to be switched off for take-off, the packs should be switched back on as soon as thrust performance allows.

7 Crew Measures

7.1 Objective

This section on crew measures addresses the precautionary measures relating to health protection and monitoring to reduce the health risks to air crew members at different phases of their travel.

7.2 Use of masks and protection equipment

An air operator must ensure that each crew member in the aircraft cabin wears:

- (a) a mask at all times during flight; and
- (b) a face shield, goggles or an equivalent protective equipment when interacting with passengers

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

except where the use of such equipment impedes the crew member's ability to discharge safety responsibilities.

An air operator must ensure that each flight crew member wears a mask while in the cockpit, except where —

- (a) the wearing of mask hampers effective communication with other flight crew members in the cockpit or with a person on the ground, including an air traffic controller;
- (b) the flight crew member needs to put on an oxygen mask; or
- (c) the use of the mask impedes the flight crew member's ability to discharge safety responsibilities in operating the aircraft.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

7.3 Health monitoring

To maintain good personal hygiene, an air operator should remind crew to wash their hands regularly. If crew's hands are not visibly dirty, the preferred method is using an alcohol-based hand rub for 20–30 seconds using the technique in accordance with guidelines published by the Ministry of Health. Otherwise, crew should wash their hands with soap and water for 40–60 seconds using the appropriate technique.

An air operator must ensure that a crew member is relieved from flight duty if he or she is unwell with fever or has any of the COVID-19 symptoms when reporting for duty for a flight, is diagnosed or suspected to have COVID-19 infection in the last 21 days or has had close contact in the last 14 days with any individual who has been infected or is suspected to be infected with COVID-19.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

If any crew member is found to be febrile or unwell, the air operator should refer the crew member to the nearest clinic in the airport to be assessed on their fit-to-fly status.

Additionally, an unwell crew member should stop working, notify the pilot-in-command, and follow up with airline medical and public health officials upon landing.

7.4 Measures on board the aircraft during flight

An air operator must ensure that each cabin crew member is assigned to attend to a designated section of the aircraft and, as far as practicable, remains within that designated section during the course of his or her duty, except when responding to an emergency on board.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

An air operator must ensure that each positioning or resting crew member is seated at least 2 metres away from any passenger. The air operators must also, to the extent practicable, designate one lavatory for the exclusive use of the crew.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

An air operator must ensure that the amount of interaction between crew members is minimised, and that meal or beverage services are not provided unless appropriate measures are taken to minimise interaction between the crew members and passengers.

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

An air operator should provide crew with sufficient quantities of cleaning and disinfectant products for use during flight. For on board safety demonstrations, the air operator should ensure that the need for sharing of equipment among crew is minimised to reduce likelihood of possible transmission. If required, the equipment should be thoroughly sanitised between each use.

Access to the flight deck should be limited to the greatest extent possible and preferably, only one person should be designated to be able to enter cockpit when necessary. An air operator should brief flight crew members to only leave the flight deck for short physiological breaks and scheduled rest. When leaving flight deck, all items should be stowed, and personal items removed, to prepare the flight deck for cleaning and disinfection. Prior to each cockpit crew change, the flight deck should be fully sanitised.

7.5 Post-Flight

An air operator must ensure that the crew operating a turnaround flight do not disembark from the aircraft at the destination, except:

Directives No. 9/2020 (as amended by Amendment No.1) and 10/2020

- (a) to carry out external safety inspections of the aircraft;
- (b) for health or security screening where required by the local authorities;
- (c) crew who are laying over in Singapore (in the case of foreign air operator), or in a location other than Singapore (in the case of a Singapore air operator).

7.6 Layover

Air operators may layover their crew for flights that require a layover due to flight time limitations or an aircraft-on-ground (AOG) situation.

A foreign air operator must not lay over or position its crew in Singapore unless the lay over or positioning is permitted by the Director-General of Civil Aviation for the specified period. For approved crew lay over in Singapore, the foreign air operator must ensure that crew members embark or disembark the aircraft at different times, or use a separate entrance or exit, from that of passengers.

Directive No. 10/2020

A foreign air operator must also ensure that the necessary provisions are made to comply with the layover requirements spelt out in the relevant Directive and Circular. As of the date of this publication, the relevant Directive and Circular are:

Directive No.
10/2020
Circular 2020/38

- Directive 10/2020
- Circular 2020/38

A Singapore air operator must ensure that each of its crew members, including positioning crew, who lays over at an overseas station, embarks or disembarks the aircraft at different times, or use a separate entrance or exit, from that of passengers.

Directive No.
9/2020 (as
amended by
Amendment
No.1)

The Singapore air operator must also ensure that the necessary provisions are made to comply with the layover requirements spelt out in the relevant Directive. As of the date of this publication, the relevant Directive is Directive 9/2020 (Amendment No. 1).

Directive No.
9/2020 (as
amended by
Amendment
No.1)

7.7 Unwell crew on board the aircraft during flight

If a crew member becomes unwell and shows any COVID-19 symptoms during a flight, or for the case of a foreign air operator, during a flight to Singapore, the air operator must require the cabin crew to take the following measures —

Directives No.
9/2020 (as
amended by
Amendment
No.1) and
10/2020

- isolate and seat the unwell crew member in the emergency quarantine area;
- ensure that the unwell crew member wears a mask if his or her condition permits;
- reserve the lavatory closest to the emergency quarantine area for exclusive use by the unwell crew members;
- arrange for the unwell crew member to receive medical attention upon landing; and
- allow the unwell crew member to disembark only after all other passengers have disembarked, unless the unwell crew member needs urgent medical attention.

For cabin crew who have interacted with a passenger who is unwell or suspected to be infected, the air operator should ensure that such crew do not visit the flight deck unless it is operationally necessary to do so.

8 Reference Materials

- ICAO CART Take-off Document: Guidance for Air Travel Through the COVID-19 Public Health Crisis (dated 5 November 2020)
- EASA-ECDC COVID-19 Aviation Safety Health Protocol – Operational guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic (Issue 2, dated 30 June 2020)
- IATA Guidance for Flight Operations During and Post Pandemic Edition 2 (dated 19 June 2020)
- COVID-19 (Temporary Measures) (Control Order) Regulations 2020
- MOM advisory – Requirements for Safe Management Measures at the workplace (dated 1 June 2020)
- Directive No. 9/2020 (dated 12 October 2020)
- Directive No. 9/2020 (Amendment No.1) (dated 21 October 2020)
- Directive No. 10/2020 (dated 21 October 2020)
- Circular 2020/23 (dated 23 March 2020)
- Circular 2020/38 (dated 25 September 2020)