

INTERNATIONAL CIVIL AVIATION ORGANIZATION



AIR TRAFFIC SERVICES GUIDANCE MATERIAL FOR OPERATION IN A COVID-19 CONTEXT

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INTRODUCTION

Purpose of the Document/Guidelines

1.1 The purpose of this document is to raise awareness, provide information, and to draw attention of Civil Aviation Authorities (CAAs) and Air Navigation Service Providers (ANSPs) towards key points to be taken into consideration for Air Traffic Services (ATS) provision under the coronavirus disease (COVID-19) pandemic, in order to enhance measures in place to allow the safe continuity of air operations.

1.2 Despite the fact that there is currently a significant reduction in air operations, the provision of air traffic services continues to be a fundamental part of the essential supply chain that enables us to face COVID-19 pandemic. In any case, it is expected that the gradual reactivation of operations will be carried out in an environment in which the threat from the COVID-19 contagion is still relevant. Consequently, the ICAO NACC Regional Office has taken the initiative to compile this material with the objective of providing information that may not be readily available or dispersed in different previously prepared documents.

1.3 It is expected that the content of this material will be improved as more information becomes available and States trial additional measures.

1.4 The outbreak of novel coronavirus (COVID-19) presents a complex scenario for CAAs and ANSPs, in order to promote the reduction of public health risk and to ensure the continuity of air operations. Taking into consideration that the need to ensure the availability of ATS goes beyond the State's own borders, and that ATS technical/operational personnel is of strategic importance for the safety and continuity of air transport, even when air operations have been limited, the following measures, specifically proposed to address key personnel of Air Navigation Services are recommended. *These recommendations should be considered as a complement to those established by the health authorities corresponding to each State, other related ICAO Standards and Recommended Practices (SARPs), and the recommendations made by both the World Health Organization (WHO)/Pan American Health Organization (PAHO) and ICAO.*

Brief Description of the Evolution of the Pandemics

1.5 On 31 December 2019, an outbreak of pneumonia of unknown aetiology was reported in Wuhan City, Hubei province of the People's Republic of China. On 9 January 2020, Chinese authorities reported that the cause of this viral pneumonia was initially identified as a new coronavirus, which is different from any other human coronavirus discovered so far. The disease has consequently been named as COVID-19. On 30 January 2020, the Director General of the WHO declared the outbreak of COVID-19 to constitute a Public Health Emergency of International Concern (PHEIC)¹.

¹ Joint statement World Health Organization and International Civil Aviation Organization
<https://www.icao.int/Security/COVID-19/Pages/Statements.aspx>

1.6 COVID-19 is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. At this time, there are no specific vaccines or treatments for COVID-19. However, there are many ongoing clinical trials evaluating potential treatments.²

Impact to Aviation

1.7 Due to the nature and propagation of COVID-19, States across the globe have implemented a number of control measures, including travel restrictions. Travel restrictions measures include limitations and total closure of borders, causing an almost total paralysis of the flow of passengers, affecting air operators, airports and related services.

1.8 The latest estimates indicate that the possible COVID-19 impact on world scheduled passenger traffic for the full year 2020, compared to baseline (business as usual, originally-planned), would be:

- Overall reduction ranging from **32% to 59% of seats offered by airlines**
- Overall reduction of **1,815 to 3,213 million passengers**
- Approx. **USD 236 to 419 billion potential loss** of gross operating revenues of airlines

1.9 The impacts depend on duration and magnitude of the outbreak and containment measures, the degree of consumer confidence for air travel, and economic conditions, etc.³

Current Situation and Outlook

GLOBAL SITUATION

- **Air passenger traffic:** An overall reduction of air passengers (both international and domestic) ranging from 35% to 65% in 2020 compared to 2019 (by ICAO)
- **Airports:** An estimated loss of over 50% of passenger traffic and 57% or over USD 97 billion airport revenues in 2020 compared to business as usual (by ACI)

² Home/Health topics/Coronavirus, World Health Organization
https://www.who.int/health-topics/coronavirus#tab=tab_1

³ Effects of Novel Coronavirus (COVID-19) on Civil Aviation: Economic Impact Analysis. ICAO, Air Transport Bureau

- **Airlines:** A 48% decline of Revenue Passenger Kilometres (RPKs, both international and domestic) in 2020 compared to 2019 (by IATA)
- **Tourism:** A decline in international tourism receipts of between USD 910 to 1,170 billion in 2020, compared to the USD 1.5 trillion generated in 2019, with 96% of worldwide destinations having travel restrictions (by UNWTO)
- **Trade:** A fall of global merchandise trade volume by between 13% and 32% in 2020 compared to 2019 (by WTO)
- **Global economy:** A projected -3% contraction in world GDP in 2020, far worse than during the 2008–09 financial crisis (by IMF)

REGIONAL CONTEXT

1.10 In the NAM/CAR Regions the scenarios are as diverse as the nature of both regions. Although the States and Territories of these regions have taken measures to reduce or prevent the spread of this disease, the context in which these measures have affected aeronautical operations has different implications.

1.11 Almost all of the States closed their airports, gradually allowing the development of humanitarian and repatriation flights, landing in emergency situations, and freeing cargo operations from these restrictions, for obvious reasons.

1.12 The scenario for those States with wider territorial spaces and a significant number of domestic flights has been more flexible, the same for those aerodromes that serve as a hub for cargo and parcel companies.

1.13 For the States/Territories of the CAR Region, which Flight Information Regions (FIRs) serve as a connection between different regions, the provision of air navigation services has been maintained, in order to allow overflights. In some cases, for reasons of the convenience of health systems and border controls, the provision of air traffic services has been suspended at some aerodromes that were not receiving international flights anyway.

1.14 In any case air operations are reduced by 56% in North America and 88% in the Caribbean compared to 2019 statistics.⁴

⁴ CANSO-Aireon Data Driven Insights

CONTINGENCY PLANNING

ICAO Requirements

2.1 The ICAO SARPs provide the fundamental basis for the harmonized sustainability of the safety and efficiency of civil aviation worldwide, promoting the standardization of functional and performance requirements of civil aviation facilities and air navigation services that support the orderly development of air transport.

2.2 Annex 11 – *Air Traffic Services* to the Chicago Convention requires air traffic services authorities to develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible. Such contingency plans should be developed in close coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with the affected airspace users.

2.3 Annex 11 Attachment C offers guidelines to assist States in providing for the safe and orderly flow of international air traffic in the event of disruptions of air traffic services and related supporting services, and in preserving the availability of major world air routes within the air transportation system in such circumstances.

2.4 The various circumstances surrounding contingency situations preclude the establishment of exact detailed procedures to be followed.

2.5 In the case of COVID-19, there is a threat of a different nature to those that we have normally analysed in relation to the provision of ATS. However, the SARPs for the implementation of contingency procedures serve as the framework that allows responding to different scenarios.

Different Levels for Contingency Planning

2.6 ATS providers address contingency arrangements at different levels, in order to ensure safety and continuity of air traffic operations. Each level complements each other, detailing different layers of interactions and procedures. Normally three levels for contingency planning are classified in what is normally referred as hierarchy of contingency plans.⁵

- Level 1, for internal State plans dealing with internal/domestic coordination actions for the air navigation service providers;
- Level 2, for coordinated (inter-State) contingency plans involving two or more States; and

⁵ ASIA/PACIFIC REGION ATM CONTINGENCY PLAN, 2019

- Level 3, to detail contingency arrangements in the event of partial or total disruption of Air Traffic Services (ATS) designed to provide alternative routes, using existing airways in most cases, which will allow aircraft operators to fly through or avoid airspace within the relevant FIR.

2.7 Preventive and reactive measures related to COVID-19 will normally start at level 1 planning, enhancing basic protection and operational procedures to protect ANS facilities and personnel. Nevertheless, level 2 and 3 planning may include now additional requirements where partial or total interruption of ATS will be required, caused not by external circumstances but internal events.

Dealing with Simultaneous Contingency Scenarios

2.8 One of the flaws that contingency and emergency planning has experienced in practice is the limitation of its scope to individual contingency scenarios. In other words, it is taken into consideration that the controls implemented can respond to a threat that could potentially limit or suspend the provision of the service, ignoring the possibility that simultaneous threats may aggravate or affect the service in conjunction. The importance of preparing and testing contingency plans becomes increasingly relevant, considering the implementation of risk management mechanisms that will be mentioned later.

Business Continuity Best Practices

2.9 Some organizations that provide air navigation services have taken more advanced steps in addressing the sustainability of their operations from a broader perspective, by implementing business continuity plans. Although these planning criteria normally respond to organizations with a certain maturity in their organizational culture, it is no less true that the analysis and guidelines of other industries can be applied in the field of ATS. In the present case, of COVID-19, organizations in other areas may have reactive elements that complement very effectively the controls that are planned, mainly those that have traditionally been prepared to respond to threats of this nature.

PROTECTIVE MEASURES

3.1 Despite the high level of automation of the main functions for the provision of ATS, the human element continues to be the link that allows the interaction of the different systems, directing their operation. In this sense, the vulnerability of the human element to the contagion of COVID-19 raises the need to protect the integrity of personnel both in the work environment and in the context of their interaction with daily life.

3.2 This places an additional responsibility to ANS personnel, not only being concerned by their individual health but also being reminded of the importance they have for the sustainability of their system. This, ultimately, is a matter of raising awareness among staff about their individual importance and as a group to support the efforts that are intended to respond to this pandemic. Indeed, the level of interaction of staff can have a significant effect on the continuity of the service, as the contagion of a member of the team can lead to the spread of the disease and compromise the continuity of the air transport.

How COVID-19 Spreads⁶

3.3 When someone who has COVID-19 coughs or exhales, they release droplets of infected fluid. Most of these droplets fall on nearby surfaces and objects, such as desks, tables or telephones. People could catch COVID-19 by touching contaminated surfaces or objects, and then touching their eyes, nose, or mouth. If they are standing within 1 meter of a person with COVID-19 they can catch it by breathing in droplets coughed out or exhaled by them. In other words, COVID-19 spreads in a similar way to flu⁷.

Basic protective measures

PROTECTING YOURSELF AND OTHERS FROM THE SPREAD COVID-19⁸

3.4 The following recommendations are issued by the World Health Organization as globally accepted practices. However, *they do not attempt to replace those measures ordered or implemented by the corresponding authorities in each State, or those established by the air navigation service provider.*

3.5 You can reduce your chances of being infected or spreading COVID-19 by taking some simple precautions (World Health Organization):

- Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water.
Why? Washing your hands with soap and water or using alcohol-based hand rub kills viruses that may be on your hands.

⁶ Getting your workplace ready for COVID-19, World Health Organization
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>

⁷ Getting your workplace ready for COVID-19, World Health Organization
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>

⁸ Coronavirus disease (COVID-19) advice for the public, World Health Organization
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>

- Maintain at least 1 metre (3 feet) distance between yourself and others.
Why? When someone coughs, sneezes, or speaks they spray small liquid droplets from their nose or mouth which may contain virus. If you are too close, you can breathe in the droplets, including the COVID-19 virus if the person has the disease.
- Avoid going to crowded places.
Why? Where people come together in crowds, you are more likely to come into close contact with someone that has COVID-19 and it is more difficult to maintain physical distance of 1 metre (3 feet).
- Avoid touching eyes, nose and mouth.
Why? Hands touch many surfaces and can pick up viruses. Once contaminated, hands can transfer the virus to your eyes, nose or mouth. From there, the virus can enter your body and infect you.
- Make sure you, and the people around you, follow good respiratory hygiene. This means covering your mouth and nose with your bent elbow or tissue when you cough or sneeze. Then dispose of the used tissue immediately and wash your hands.
Why? Droplets spread virus. By following good respiratory hygiene, you protect the people around you from viruses such as cold, flu and COVID-19.
- Stay home and self-isolate even with minor symptoms such as cough, headache, mild fever, until you recover. Have someone bring you supplies. If you need to leave your house, wear a mask to avoid infecting others.
Why? Avoiding contact with others will protect them from possible COVID-19 and other viruses.
- If you have a fever, cough and difficulty breathing, seek medical attention, but call by telephone in advance if possible and follow the directions of your local health authority.
Why? National and local authorities will have the most up to date information on the situation in your area. Calling in advance will allow your health care provider to quickly direct you to the right health facility. This will also protect you and help prevent spread of viruses and other infections.

- Keep up to date on the latest information from trusted sources, such as WHO or your local and national health authorities.
Why? Local and national authorities are best placed to advise on what people in your area should be doing to protect themselves.

3.6 Advice on the safe use of alcohol-based hand sanitizers

- To protect yourself and others against COVID-19, clean your hands frequently and thoroughly. Use alcohol-based hand sanitizer or wash your hands with soap and water. *If you use an alcohol-based hand sanitizer, make sure you use and store it carefully.*
- Keep alcohol-based hand sanitizers out of children's reach. Teach them how to apply the sanitizer and monitor its use.
- Apply a coin-sized amount on your hands. There is no need to use a large amount of the product.
- Avoid touching your eyes, mouth and nose immediately after using an alcohol-based hand sanitizer, as it can cause irritation.
- Hand sanitizers recommended to protect against COVID-19 are alcohol-based and therefore can be flammable. *Do not use before handling fire or cooking.*
- Under no circumstance, drink or let children swallow an alcohol-based hand sanitizer. It can be poisonous.
- Remember that washing your hands with soap and water is also effective against COVID-19.

Enhanced procedures for ANS facilities

BRING PEOPLE ON BOARD

3.7 The key aspect to consider when implementing measures to address operations in a COVID-19 context is the need to get people involved and willingly respond to the proposed measures. For that:

- Ensure basic risk management procedures are implemented and adequately discussed, considering basic staff requirements to support the ANS.
- Raise awareness among ANS technical staff about preventing the spread of the virus, both in the workplace and in their daily lives.

MAKE SURE YOUR WORKPLACES ARE CLEAN AND HYGIENIC

3.8 Due to the time staff spend at their jobs and the necessary interaction with co-workers, these simple measures can significantly reduce the risk of contagion in the workplace.

- Establish and implement enhanced cleaning and disinfection procedures for all ANS facilities, including door handles, handrails, surfaces (e.g. desks, tables and armrests) and objects (e.g. telephones, keyboards).
 - Each working position should be disinfected after each change-over.
- Establish and implement enhanced cleaning and disinfection procedures for communication equipment (head-set or microphones) as well as equipment (VCCS or handset radios) and consoles.
 - The use of personal communication adapters (headsets or microphones) can significantly reduce the possibility of contagion, which should be disinfected before/after used and properly stored.

PROMOTE REGULAR AND THOROUGH HAND-WASHING

3.9 The coronavirus does not walk from one place to another; it is the people who transport it. Hands are one of the main means of propagation. Maintaining hand hygiene kills the virus and prevents its spread. For this:

- Establish and implement preventive procedures on workplaces such as the use of alcohol gels and disposable cleaning towels.
- Make sure that staff, contractors, and customers have access to places where they can wash their hands with soap and water.

PROMOTE GOOD RESPIRATORY HYGIENE IN THE WORKPLACE

3.10 Good respiratory hygiene prevents the spread of COVID-19.

- Provide additional guidance to ANS personnel that need to work in close distance from each other (coordination, active-planner controllers, etc.).
- Avoid personal contact and add any other recommended measures.
- Ensure that face masks⁹ and paper tissues are available at your workplaces, along with closed bins for hygienically disposing of them.
- Some ATC units have separated the controller and planner functions to increase spacing. This can be a good approach where availability of services is not compromised.

⁹ Ordinary medical masks rather than N95 masks

IMPLEMENT ACCESS CONTROL MEASURES

3.11 Due to the nature of ATS, normally its work takes place in isolated areas. However, in some instances ANS share facilities in public places, like airports, or may share the same building with other areas of the CAA. In any case, please consider the following:

- Consider restricting access to areas related to the provision of air navigation services, especially for those units that share their facilities with other ANS and CAA departments.
- Consider limiting visitor access to facilities and establish procedures to allow access to support staff or contractors, who are required to access facilities.

ADDRESS RISK FOR CONTAGION FOR DIRECT SERVICES PROVISION PERSONNEL

3.12 Some areas of ANS, like Air traffic services Reporting Office (ARO), FIR, Meteorology (MET), provide services to the public.

- Consider special guidance and procedures for ANS technical staff that provides direct services to aviation community.
- Consider personnel that may be more exposed to contagion or transmit COVID-19 for their interaction with crews, flight dispatchers and other ANS.
- Establish and implement appropriate measures in these units, as essential to reduce the risk of contagion.
- When possible, use electronic means for the provision of these services, since that would reduce the need to direct personal contact.

ENHANCE COMMUNICATION AND AWARENESS

3.13 Communication and awareness is key to gain this battle.

- Display posters promoting hand-washing – ask your local public health authority for these or consult www.who.int
- Display posters promoting respiratory hygiene. WHO has available awareness material that is regularly updated.¹⁰
- Combine with other communication measures such as offering guidance from occupational health and safety officers, briefings at meetings, and information on intranet sites.
- Brief regularly all personnel and visitors of the measures taken
- Share best practices and lessons learned with other ANSPs, States and ICAO.

¹⁰ <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>

ATC Operational Environment, Enhanced Working Procedures

FLEXIBLE ROSTERS

3.14 The main challenge faced by ATS providers during this circumstance is to be able to maintain the availability, present and future, of their personnel, adapting the capacity of the system to the requirements of the operations.

3.15 Taking into consideration that the main action taken by the authorities is the limitation of circulation, recommending people to stay at home and even work from there. This is not always feasible for some ATS tasks, which need to be carried out from the workplace. Despite the fact that operations have been significantly reduced, and sometimes there are no operations, it is necessary to maintain the availability of the ATS even with the minimum number of personnel required.

3.16 One of the actions taken is to plan for flexible rosters.

- Consider the implementation of shifts or schedule arrangements such as "permanent work teams or closed groups" reducing turnover among staff, to reduce exposure.
- Consider adjusting entry and exit times to avoid unnecessary crowding.
- Consider keeping a number of staff on call and avoiding their presence on the job unless absolutely necessary.
- Air traffic flow management (ATFM) functions are essential in these circumstances, but may also be carried-out remotely.

REDUCED HOURS OF OPERATIONS

3.17 Some aerodromes have reduced their hours of operation taking into account the travel restrictions imposed by the States and the reduction in the number of operations. Consequently, ATS can be adjusted in the same way, reducing the amount of time staff must be exposed outside of their homes. This must be adequately communicated to the aeronautical community through Notices to airmen (NOTAMs), Aeronautical Information Circulars (AICs) and other available means. Communication and consensus with users is of great importance.

SUSPENSION OF ON-THE-JOB TRAINING (OJT)

3.18 Due to the closeness and interaction that normally occurs between trainer and trainee some ATS units have decided to suspend the OJT. Although this measure can be considered prudent, and even necessary, the reality is that it could have unexpected repercussions on the availability of trained and qualified personnel to respond to the estimated recovery of operations. In any case, the guidelines previously exposed in this document may provide enough information to consider performing the OJT with certain additional controls.

3.19 Although high intensity simulator sessions may help controllers and trainees to achieve greater proficiency than they might have otherwise, it is not a substitute for OJT and instructors and ANSPs should be aware that controllers and trainees may need additional time to adjust accordingly.

3.20 Another challenge is related to performing the training in a low (or no) traffic scenario. A trainee in a live traffic environment would be likely accumulating training hours with little or no training value. Certain competencies such as the ability to work under pressure and prioritization of tasks would be more difficult to learn. Furthermore, these competencies can only be effectively assessed during busy traffic periods making it difficult for trainees to demonstrate they have attained the required level. Increased prevalence of single person operations would also make teamwork challenging to train and assess.¹¹

3.21 With all this in mind, ATS providers, with the authorization and monitoring of the CAA, can implement additional actions to the OJT, complementing the mechanisms with which the competencies and skills required to perform the functions can be achieved in an optimal way.

An adequate risk analysis of the situation and evaluation of future traffic demands will better support this decision.

Personnel wellbeing

3.22 Personnel are the ATS provider's main asset. It is the enabling element of service provision, so its well-being, physical and mental, must be a priority in this and any circumstance.

¹¹ COVID-19 (CORONAVIRUS) Guidance Material on dealing with COVID-19 in Air Navigation Facilities, IFATCA
<https://www.ifatca.org/covid-19/>

*PHYSICAL*¹²

- Implementation of health monitoring controls (temperature or similar), following WHO and national public health authorities guidelines, supported by appropriate medical staff.
- Take into consideration staff that may be at higher risk of developing severe COVID-19 illness because of age or pre-existing medical conditions. This should be considered in the risk assessment for individuals.
- Staff who are unwell or who develop symptoms consistent with COVID-19 should be urged to stay at home, self-isolate, and contact a medical professional or the local COVID-19 information line for advice on testing and referral. Where local community transmission is high, and work continues, allow for a telemedicine consultation where available, or consider waiving the requirement for a medical note for workers who are sick so that they may stay home.
- All workers should be urged to self-monitor their health, possibly with the use of questionnaires, and take their body temperature regularly.
- Thermal screening at the workplace should be considered only in the context of a combination of measures for prevention and control of COVID-19 at the workplace and along with risk communication.
- It is important to contact the local health authorities and to keep attendance and meeting records in order to facilitate or undertake contact-tracing.

MENTAL

Consider taking steps to ensure the psychosocial adjustment and wellbeing of staff. Factors affecting psychosocial adjustment include:

- Lack of information, rumors or misconceptions, increased stress (particularly sleep deprivation), infection control procedures that severely limit personal contact or hinder communication, etc.
- Mitigations include clear, honest and regular communications, clear guidance and strong social support networks.

¹² Considerations for public health and social measures in the workplace in the context of COVID-19, World Health Organization <https://www.who.int/publications-detail/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19>

3.23 *Eurocontrol Hindsight magazine* provides valuable information that can support conversations about wellbeing, not only now during the coronavirus pandemic, but permanently¹³.

3.24 The International Federation of Air Traffic Controllers Associations (IFATCA) published a document which compiles reference material for identification mechanisms and techniques that can be used to raise awareness on the subject of coping with stress and anxiety related to COVID-19¹⁴.

REACTIVATION OF SERVICES

4.1 Despite the fact that the outlook regarding the lifting of travel restrictions imposed by the States is not yet clear, the truth is that for understandable reasons they will be relaxed in the near future.

4.2 The behaviour of the air transport system, however, responds to factors that are not directly controlled by these decisions, so the reactivation of operations will have a behaviour more related to the confidence of the traveling public.

4.3 In this context, a slow but progressive increase in operations could be expected, with peaks associated with certain types of operations, such as cargo or citizen return operations.

State Decision Making Process with Regards to Public Traveling

4.4 CAAs and ANSPs need to maintain close contact with government high level decision makers to provide advice on the impact for proposed measures, to plan and maintain up to date their operational response.

4.5 It is important to remember, not only that aviation serves as a primary means of connection in many cases, but also as a fundamental tool to support countries' economic recovery.

Communication/Collaboration with Stakeholders

4.6 Stakeholders, such as air operators, airports, etc. have been strongly affected by this situation, and will continue to be for a considerable time. Some will not survive this situation and will have to end their operations.

¹³ HindSight 30 focused on the theme of Wellbeing, Eurocontrol
https://www.skybrary.aero/index.php/Hindsight_30

¹⁴ Coping with COVID-19. A short guide on dealing with stress and anxiety for air traffic controllers, IFATCA
<https://www.ifatca.org/covid-19/>

4.7 In this context, communication and collaboration with users and other stakeholders is of paramount importance for their future survival.

4.8 Some procedures that may be unnecessary at this time, due to the low number of operations, should be taken into account to be relaxed or temporarily removed, just as the current circumstance may be used to test new procedures that could improve efficiency in service provision. ATS providers' commitment is to explore and agree on measures to make service provision more efficient without compromising safety.

4.9 Some service providers have already established agreements with air operators to allow the use of direct flights or preferred routes, trying to adapt to the needs of the operators more efficiently. All this can be part of a short-medium term plan.

4.10 In addition, the Stakeholders will offer the best thermometer of the possible behaviour of the air transportation system. Valuable information will come from their demands.

Demand and Capacity Balancing

4.11 Although no significant problems are anticipated due to excess demand in the first days of the restrictions being lifted, the fact is that the conjunction of unexpected spikes and previously imposed personnel restrictions could create threats to safety that must be managed.

4.12 This affects, to a greater extent, those air traffic systems that have not yet implemented procedures for air traffic flow management. Here collaboration and communication play a fundamental role.

Simplified Collaborative Decision Making Procedure¹⁵

4.13 ICAO has developed a simplified Collaborative Decision Making (CDM) procedure to provide effective process for ANSPs in order to carry out cross-border coordination with their adjacent ANSPs taking into consideration the circumstances that would have impact on traffic flows. This includes going into a contingency situation or returning to normal operations. The main objective of the procedures, however, is to provide a better collaborative platform for the coordination and management of traffic during the disruption caused by the COVID-19 Pandemic. These procedures would also support a smooth and less challenging return to normal operations.

¹⁵ ICAO COVID-19 outbreak simplified procedure for air traffic management collaborative decision making and sharing of information <https://www.icao.int/safety/COVID-19OPS/Documents/ATM/COVID-19%20CDM%20Procedure%20Ed1.0.pdf>

4.14 The procedures are most suitable for those States that have not implemented or established an ATFM structure yet; as well as in the ICAO Regions where no regional/sub-regional ATFM solutions had been implemented. The well-established regional or sub-regional ATFM solutions would normally ensure collaboration between their members, however, it is recognized that coordination with their adjacent States/regions might remain a challenge.

Note – The procedure is not intended to replace in any form the guidance in ICAO Doc 9971 — *Manual on Collaborative Air Traffic Flow Management (ATFM)* or provisions in other ICAO documentation related to ATFM/CDM or regional ATFM/CDM plans/guidance.

ATC Personnel Proficiency¹⁶

4.15 Managing reduced traffic levels for extended periods of time presents unique challenges for controllers. However, the return to pre-pandemic traffic levels will also present challenges. Controllers may have gone for substantial periods of time without managing increased traffic levels with a resulting decline in proficiency. Additionally, some controllers belonging to highest risk population have been maintained completely out of their functions for a significant time.

4.16 A gradual return to pre-pandemic traffic levels may permit controller proficiency to also gradually increase. However, this won't prepare controllers for the inevitable increase in 'traffic spikes' as traffic levels recover. When traffic levels start increasing, it's important for controllers to be aware of the effects operating for long periods with reduced traffic will have had on their proficiency. Controllers should expect to ask for support more often than they may have had to in the past. Controllers should also expect to have to offer more support to each other and be more mindful of potential proficiency gaps. This should also be taken into consideration by managers and supervisors.

4.17 The use of simulators, where available, presents the greatest opportunity to ensure controllers' proficiency remains at levels that will best equip them to deal with a return to pre-pandemic traffic. If necessary, new simulator lessons should be designed with the objective being to maintain the proficiency of experienced controllers rather than the more conventional uses of cross training and *ab-initio* training. More generally, simulators are probably the most useful tool for ANSPs to manage the impacts of the coronavirus (COVID-19) pandemic. Not only can they be used to help maintain the proficiency of experienced controllers, they can also be used to simulate high traffic levels to trainees in lieu of actual traffic thus minimizing any delays to their training when traffic returns to pre-pandemic levels.

¹⁶ COVID-19 (CORONAVIRUS) Guidance Material on dealing with COVID-19 in Air Navigation Facilities, IFATCA
<https://www.ifatca.org/covid-19/>

4.18 In those cases where simulators are not available, the use of virtual simulators could provide an alternative to rehearse basic functions, recreate simple scenarios or exercise the skills of personnel who have been away from service for a long time.

PROCEDURES TO ADDRESS COMPROMISED FACILITIES

Reactive Measures¹⁷

5.1 Standard operating procedures should be prepared to manage a person who becomes sick at the workplace and is suspected of having COVID-19, including placing the person in an isolation room, limiting the number of people in contact, using personal protective equipment, and performing follow-up cleaning and disinfection. It is important to ensure that staff receives appropriate medical care and support.

5.2 The plan should also include measures for protecting health, safety, and security in re-opening, closing, and modifying workplaces and work arrangements. Closing and re-opening of workplaces should be carefully planned and all possible risks for health and safety should be properly assessed and controlled.

5.3 The action plan and preventive measures put in place should be monitored and updated in case of changes in local epidemiological trends, new cases of COVID-19 at the workplace, or lack of compliance by workers, visitors, and clients or customers.

5.4 In the case of air traffic control posts, there is the additional challenge of having to take the decision to completely suspend the provision of services in order to implement control measures in case of suspected infection. This decision, due to its possible impact on the safety and continuity of operations, cannot be taken lightly, and needs to be thoughtfully deliberated.

5.5 Developing and rehearsing ATS contingency plans can significantly improve the response.

Disinfection Procedures

5.6 Disinfection procedures must be designed and implemented according to the guidelines established by the corresponding public health authorities. In the cases of ATS units, due to their location and importance, agreements should be reached to receive priority and rapid response times for disinfection, reducing the impact on civil aviation.

¹⁷ Considerations for public health and social measures in the workplace in the context of COVID-19, World Health Organization <https://www.who.int/publications-detail/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19>

5.7 In some occasions, staff may not feel confident returning to the ATS Unit after it has been disinfected, which may pose an additional burden to that already assumed by the nature of the service. ATS authorities must dialogue and previously inform Staff, and/or their representatives (such as unions and associations), about the set of measures that would be implemented for the reactivation of operations after disinfection.

SAFETY RISK MANAGEMENT

Doc 10144 – ICAO Handbook for CAAs on the Management of Aviation Safety Risks related to COVID-19¹⁸

6.1 The successful management of the COVID-19 pandemic requires the assessment and management of risks that extend beyond the boundaries of managing aviation safety risks as defined in Annex 19 — *Safety Management*. The CAA should keep in mind how their decisions may impact the risks being managed by other State authorities and that efforts by other State authorities to manage the risks that fall under their responsibility will have an impact on aviation.

6.2 A new Handbook for Civil Aviation Authorities (CAAs) on the Management of Aviation Safety Risks related to COVID-19 (Doc 10144) was developed with the support of experts serving on the ICAO Safety Management Panel (SMP). This high-level guidance is intended to support civil aviation authorities (CAAs) with the management of aviation safety risks, which fall under their responsibility, during the coronavirus disease (COVID-19) pandemic. Further guidance will be developed to support CAAs in the restart of the aviation system. Practical examples to complement this guidance are being collected and developed to be shared on the Safety Management Implementation website (www.icao.int/smi-covid19SRM).

6.3 The following paragraphs present extracts from this handbook, however, a full revision of this document is recommended.

COOPERATION, COLLABORATION AND COMMUNICATION

The means to cooperate, collaborate and communicate (3Cs) are vital functions exercised by many States in tackling global crises. Together, the “3Cs” are key to address the pandemic and achieve the best outcomes for the entire aviation community and society as a whole. CAAs should recognize that these existing functions also continuously contribute to the effective implementation of an SSP, which is important in managing aviation safety risks, including the impact of COVID-19 to the aviation system. It is important to remember that, “Perfection is the enemy of the good (when it comes to emergency management)”, Dr. Michael Ryan, Executive Director 2010, World Health Organization (WHO).

COVID-19 has highlighted the complex interfaces within States, and externally, demonstrating the challenges of collaborative decision-making. Decision-making may need to be made based on limited information, taking into account broader

¹⁸ ICAO Handbook for CAAs on the Management of Aviation Safety Risks related to COVID-19 Doc 10144
<https://www.icao.int/safety/SafetyManagement/Pages/COVID-19-Safety-Risk-Management.aspx>

risks than just aviation safety. CAAs are encouraged to adopt a safety risk management approach to decision-making.

Identifying interfaces and establishing channels for communication provides access to expert opinion, which is valuable in understanding the available information in a dynamic situation. Responding under a crisis situation may require qualitative decision-making using a risk management approach and asking practical questions (e.g. What supporting evidence is available?, What are the consequences of alternative options?, How will delays in decisions impact?, What is the risk tolerability for the specific situation?, What are the available resources?).

SUGGESTED DATA AND INFORMATION TO COLLECT AND ANALYSE TO SUPPORT SAFETY RISK MANAGEMENT

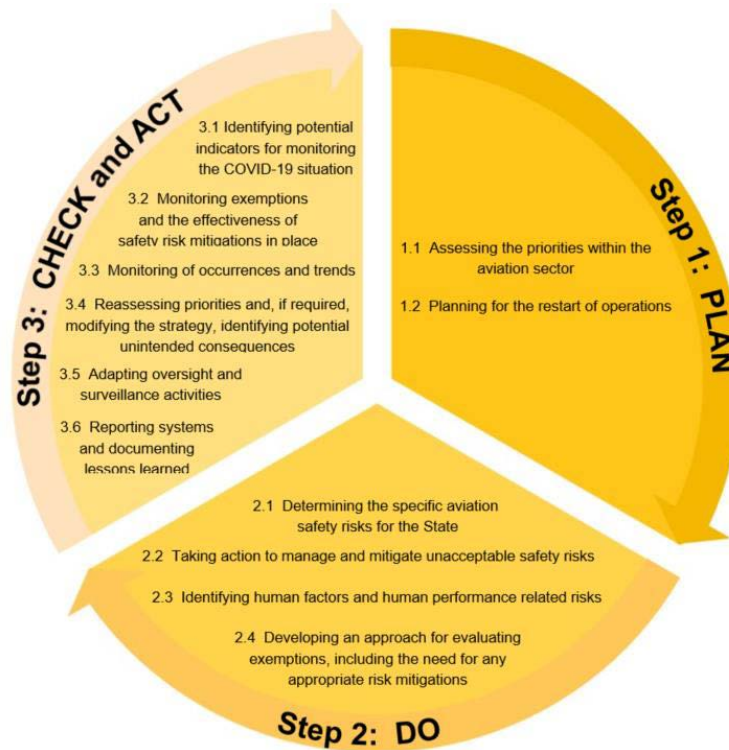
6.4 The ICAO Doc 10144 includes a table for suggested data and information to be collected and analysed to support safety risk management, which is included below:

Categories	Data and information to be collected and analysed
Data on the current COVID-19 including absolute and relative rates	<ul style="list-style-type: none"> • number of cases, considering active and recovered • number of deaths reported • number of tests conducted as per State policies • expected projections • freedom to travel, immigration and customs restrictions for destinations • quarantine of passengers and crews • availability of competent personnel and resulting capacity to provide services (considering those with underlying health conditions or are self-isolating) • remote working capabilities including flexible access to equipment
Status and volume of traffic during the pandemic	<ul style="list-style-type: none"> • expected volume and rate of flights over time including the restart of operations • general aviation flights • humanitarian flights for evacuation and repatriation • medical flights • cargo flights performed with aircraft certified for transportation of passengers • transportation of dangerous goods or medical equipment • State aircraft operations (military, customs, police, etc.)
Impacted operational personnel according to ICAO Annex 1 — Personnel Licensing (air traffic controllers, pilots and cabin crew, aircraft maintenance engineers, flight dispatch, aeronautical meteorology personnel, etc.)	<ul style="list-style-type: none"> • number and due date of expiring licenses • due date for medical certificates for crew members • impact on crew training and checking (i.e. recency of experience, license proficiency check, operator proficiency check) • recurrent mandatory training related to special operations • years of experience of professionals
Continuity of flight operations	<ul style="list-style-type: none"> • number of organizations that are closed or in a difficult financial situation • number and due date of approvals and certificates • maintenance issues such as storage and de-storage of aircraft, due maintenance, fuel

Categories	Data and information to be collected and analysed
	<p>system management, lack of spare parts, expiring airworthiness certificates</p> <ul style="list-style-type: none"> • surveillance activities required to maintain validity of certificates (i.e. due audits) and exemptions in place • availability of resources (in-house or contracted) to support activities such as preparation of aircraft to flight, reconfiguration and affecting mass and balance of the aircraft, maintenance, disinfection of aircraft • exceptional operational considerations related to flight time limitations, flight duty periods and fatigue, accommodation facilities and transportation for crew, human factor aspects, etc.
Operational status of the air navigation services (ANS) provision and limitations	<ul style="list-style-type: none"> • availability of communications, navigation, and surveillance (CNS) services • availability of air traffic control (ATC) services and management • connectivity with global systems, supporting centres and meteorological offices • contingency planning affecting operations (airspace limitations, capacity reduction) • status of ATC unit/facilities (availability, limited time of operations, change or transfer of units/facilities)
Aerodromes and infrastructure availability	<ul style="list-style-type: none"> • current movements by airport • aircraft parking positions available including the use of other paved surfaces (to be avoided, where possible) • due maintenance of navigation or airport equipment • location of parked aircrafts where maintenance or storage procedures could occur under restrictions • availability of critical services (handling, catering, fueling, medical, immigration, customs, public health, security)
Impact on CAA's oversight activities	<ul style="list-style-type: none"> • capabilities to process certification, registration/deregistration, authorization and exemption requests • number of audits and inspections postponed during the pandemic, or alternative means of surveillance • number and type of exemptions granted in all the domains (i.e flight time limitation, transportation of cargo in the passenger compartment, crew training and checking, maintenance and continuous airworthiness etc.) • conditions under which differences would be acceptable to the destination States

APPLICATION OF SAFETY MANAGEMENT PRINCIPLES

6.5 The decision-making process involves assessing the COVID-19 situation and the collection and analysis of available data and information within the State. The following provides a safety risk management approach using the plan–do–check–act (PDCA) cycle for managing aviation safety risks during the pandemic. The safety management principles as described in this Chapter of the Handbook, can be applied by States at different levels of SSP implementation.



CONSIDERATIONS WITH REGARD TO SAFETY OVERSIGHT/CAAs

Safety oversight responsibilities

7.1 The responsibilities of the CAAs regarding safety oversight remain despite the contingency we are dealing with. Obviously, the current situation poses additional challenges that must be addressed in a manner consistent with the requirements of the Chicago Convention.

7.2 To assist all States and relevant stakeholders, ICAO has launched a COVID-19 Operational Safety Measures public website (<https://www.icao.int/safety/COVID19OPS>) that will provide measures to ensure safe operations during this period. All States are encouraged to make use of this website and inform ICAO of any latest developments using the information highlighted on the website.¹⁹

Personnel licensing requirements

7.3 During the period of these contingency measures, particular attention should be given to the Standards and Recommended Practices (SARPs) related to certificates and licenses. In this regard, States are reminded of their obligations under Article 38 of the Convention to notify ICAO of any differences that may arise. In order to facilitate the notification and dissemination of temporary differences during this period, a COVID-19 Contingency-Related Differences (CCRDs) sub-system accessible through the Electronic Filing of Differences (EFOD) dashboard (www.icao.int/usoap) has been created and will also tentatively be maintained through 31 March 2021.

7.4 Particular attention should be given to Article 39 of the Convention which states that any aircraft or person that does not satisfy in full applicable Standards or conditions shall have endorsed on or attached to relevant certificate or license a complete enumeration of the details or particulars in respect of which the aircraft or person does not satisfy such requirements or conditions. It should be further noted that Article 40 of the Convention provides that no aircraft or personnel having certificates or licenses so endorsed shall participate in international navigation, except with the permission of the State or States whose territory is entered.

7.5 In the case of ATC personnel it should be taken into consideration:

- a. Validity of ratings;
- b. Validity of medical assessments;
- c. Validity of licenses and period for renewal; and
- d. Language proficiency requirements.

¹⁹ ICAO State Letter AN 11/55-20/50, 3 April 2020, Operational measures to ensure safe operations during the COVID-19 pandemic

7.6 Regarding the proficiency of ATC personnel, far from what many people might think, working in a low traffic environment has significant challenges to maintain the expected levels of safety. CAAs should also take that into consideration and collaborate with ATS providers accordingly.

Flight Inspection Periodicity Considerations for Radio Navigation Aids during the COVID-19 Pandemic and Related Recovery Phase

7.7 ICAO has published material to discuss issues related to flight inspection that could arise during the COVID-19 pandemic and during the recovery phase, with particular regard to periodicity. The main purpose of this material is to ensure that flight inspection will be able to maintain safe operation of navigation aids during the pandemic and will not be on the critical path to aviation recovery after the pandemic. ICAO stresses the need to maintain regular ground and flight checks of navaids to ensure that they are available during recovery (delaying implementation of new facilities if necessary). It provides information on flight inspection experiences and best practice currently adopted in several ICAO States, including recommendations on how to deal with periodicity intervals when delays are experienced.²⁰

ICAO REQUIREMENTS ON FLIGHT INSPECTION PERIODICITY

7.8 The fundamental ICAO provision addressing flight inspection in general is the Standard in Annex 10 – *Aeronautical Telecommunications*, Volume I, Chapter 2, 2.2.1.

7.9 Guidance on flight inspection, including periodicity, is given in the ICAO Doc 8071 – *Manual on Testing of Radio Navigation Aids*. The general aspects of periodicity requirements are addressed in section 1.15 of the document, whereas suggested periodicities for specific navigation aids are given in the chapters corresponding to each aid. States may have determined their periodicity requirements based on local circumstances and as such the recovery should consider these periodicities.

OPERATIONAL MEASURES

7.10 While flight inspection operations have been to some extent facilitated by the low air traffic levels currently prevailing, overall significant operational restrictions are being experienced, calling for special measures to mitigate them.

²⁰ ICAO/Safety/COVID-19 OPS/Air Navigation Services
<https://www.icao.int/safety/COVID-19OPS/Pages/ANS.aspx>

7.11 A common approach adopted for flight inspection operations during pandemic is to keep individual missions within a single day, returning to base at the end of the day and thus avoiding overnight stays at the destination.

7.12 The impact of the associated reduction in efficiency could be mitigated by prioritizing regular flight inspection missions over new implementation projects (new facilities and procedures).

7.13 Furthermore, among regular missions, those addressing facilities that are approaching the flight inspection due date, particularly in the case of Instrument Landing System (ILS) Category III facilities, should be prioritized.

7.14 In some cases however, reductions in aerodrome operating hours may limit the number of working hours available in a day. In such cases and in other cases when overnight stays are necessary (e.g. to avoid exceeding flight duty time limitations), particular care should be given to assessing the chosen accommodation to ensure compliance with pandemic sanitation provisions and minimize the need for external contacts.

SPECIFIC ISSUES WITH CROSS BORDER FLIGHTS

7.15 In some cases, in which flight inspection services are supported by cross border flights (international flight service operations), a number of specific issues have been encountered:

- requirements for special authorization to access aerodromes that would otherwise be closed to all traffic;
- requirements for special authorization for crew access to country;
- requirements for quarantine on crew arrival to destination and return to base;
- difficulties in ensuring avoidance of contact between crew and ground personnel at destination (e.g. due to custom/immigration controls); and
- suspension of ground maintenance activities.

7.16 These issues were largely unexpected, due to the situation being effectively unprecedented, and were not taken into account in the original inspection schedules. They have required *ad hoc* adjustments, negotiated bilaterally on a case-by-case basis by the entities involved. This has typically led to scheduling delays. However, notwithstanding the delays, cross border flights have remained largely feasible, if less efficient, thanks to the commitment of all the parties to the flight inspection requirements.

7.17 In the process, the need for international recognition in pandemic situations of the special status and needs of flight inspection as a key element of the safety-critical air navigation infrastructure has been highlighted. Future work by ICAO will address the development of guidance to States on facilitating cross-border flight inspection operations in pandemic situations, including development of an advisory health safety protocol to minimize interaction between crew and ground personnel.

DEALING WITH POTENTIAL PERIODICITY ISSUES DURING AND AFTER THE PANDEMIC

7.18 The informal survey results (conducted by ICAO Secretariat and EUROCONTROL) suggest that in principle flight inspection should be feasible even in COVID-19 times, possibly with some restrictions requiring prioritization/rearranging of schedule as discussed above.

7.19 As a result, periodicity of flight inspection should not be affected substantially, and it should be possible to limit any potential deviations from the nominal intervals to within the time window of extension mentioned in Doc 8071, 1.15.15. While Doc 8071 makes no recommendations on the length of such time windows, the extension window needs to be a reasonable fraction of the nominal interval. For example, some States use a maximum delay of 1 month for nominal inspection periodicities of 6 months.

7.20 In cases in which nominal periodicity cannot be maintained and the appropriate extension time window is exceeded (e.g. because of initial set-up issues with cross-border operations, as discussed above), Doc 8071, 1.15.15 offers a choice of actions that may be considered:

- allowing for further extension time, after engineering evaluation and/or ground maintenance reinforcement;
- downgrading of ILS (Category III down to Category I or II); and
- temporarily removing the navigation aid from service.

7.21 In choosing among those actions, the responsible entities should take into account the exceptionality of the current situation, in which aviation has suffered an unprecedented setback and is facing what can be expected to be a very difficult recovery phase. In this context, the navigation infrastructure must remain operational both to support the reduced level of traffic during containment measures (including flights meeting critical pandemic-related needs, such as delivery of medical supplies) and to facilitate the resumption of regular flight operations. Therefore, in cases where timely flight inspection cannot be ensured, the preferred method for maintaining safe signals in space is to either take advantage of the (short) periodicity extension window, or, if a longer extension is required, to grant an extension of periodicity intervals in line with the principles described in Doc 8071.

7.22 Furthermore, in cases where flight inspection operations were suspended and periodicity intervals extended, careful planning should ensure that navigation aid availability of service can be ensured to support the recovery. At the same time, no compromise on operational safety due to non-standard performance of navigation aids should be accepted. Instead, potential extensions of nominal inspection intervals should be considered only in the presence of appropriate mitigations maintaining nominal safety levels. To this end, the provisions of Doc 8071, 1.15 should be taken into account.

7.23 Doc 8071, 1.15.2 recognizes that the suggested periodicities are given as general guidance and may be modified based on the manufacturer's recommendation or operational experience. Subsequent sections (1.15.4 – 1.15.6) discuss the factors influencing the inspection intervals, including reliability and stability of operation of the equipment, extent of ground monitoring, degree of correlation between ground and flight measurements, changes in the operating environment, manufacturer recommendations, and quality of maintenance. In many cases, modern ground facilities using current technology provide highly stable and reliable signals. A point of particular practical interest in the current context is given in 1.15.6 with the observation that equipment reliability may be adversely affected by too frequently scheduled major maintenance activities, which should therefore be limited to essential needs if extended periodicity is desired.

7.24 Further sections of Doc 8071 (1.15.7 – 1.15.8 and 1.15.10- 1.15.14) discuss the type of technical analysis that would need to be performed to extend nominal ground and flight inspection periodicities in a normal situation. While performing such detailed analysis may be unpractical in a pandemic situation, it should be noted that the most important item to ensure safe facility performance is the verification of the proper functioning of executive monitor shutdown capabilities. Special attention should also be given to site safeguarding, especially if aircraft or other large equipment is being parked near a navigation aid.

7.25 While the guidance in Doc 8071 does not explicitly address the current situation, it does indicate that, in situations in which maintaining nominal flight inspection periodicity is effectively impossible, case-by-case extensions can legitimately be considered on an exceptional basis when the relevant enabling factors are present. In other words, in the unprecedented situation now being faced by aviation, a reliable system running in a stable configuration with a history of nominal performance, undergoing regular ground checks consistent with manufacturer recommendations which indicate normal functioning, and in the absence of anomaly reports should normally qualify for an extension of the periodicity interval.

7.26 Special considerations apply to the specific case of Category III ILS. Because of the particularly demanding requirements, rigorous testing is essential. For that reason, during the current pandemic several States are prioritizing flight inspection of Category III ILS. Should it nevertheless occur that flight inspection intervals for a Category III ILS are significantly exceeded, as mentioned above a potential option would be downgrading of the facility from Category III to Category II or Category I.

FINAL COMMENTS

8.1 The situation generated by the COVID-19 pandemic presents an unprecedented challenge for global civil aviation. We are not sure what the outlook will be after the travel restrictions are lifted, nor what the new “normal” will be for the management of operations and the provision of air traffic services.

8.2 Collaboration, communication and the joint efforts of the international community will be the key with which we can get ahead.

8.3 The development and publication of guidance material by ICAO and other specialized entities of civil aviation will certainly provide initial guidance that would later become permanent procedures through the promulgation of new SARPs.

8.4 We remain committed to maintaining the safety and efficiency for civil aviation, as a mean for economic revitalization and a catalyst for the sustainable growth of peoples. In this sense, ICAO will continue to provide its support to the Region and adapt our efforts as our member States may require.