SAFETY BULLETIN

October 2021

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OCTOBER 2021 1

Cabinet d'Expertise en Aéronautique - Inscrit près la cour d'appel d'Amiens – Indépendant de l'EASA

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Notre Safety Bulletin n'est pas une institution pour les professionnels de l'aéronautique, ni une analyse de chacun des règlements. Il n'a pour vocation que d'informer les utilisateurs de moyens aériens sur les diverses activités de l'aéronautique.

Il appartient à chacun d'utiliser ces informations dans le cadre de ses activités.

Soyez professionnel, préparez vos voyages par une petite analyse des conséquences d'un déplacement.

Our Safety Bulletin is not an institution for aviation professionals, nor is it an analysis of each of the regulations. Its purpose is only to inform users of air assets about the various activities of aeronautics.

It is up to everyone to use this information in the course of their activities.

Be professional, prepare your travels with a little analysis of the consequences of a trip.

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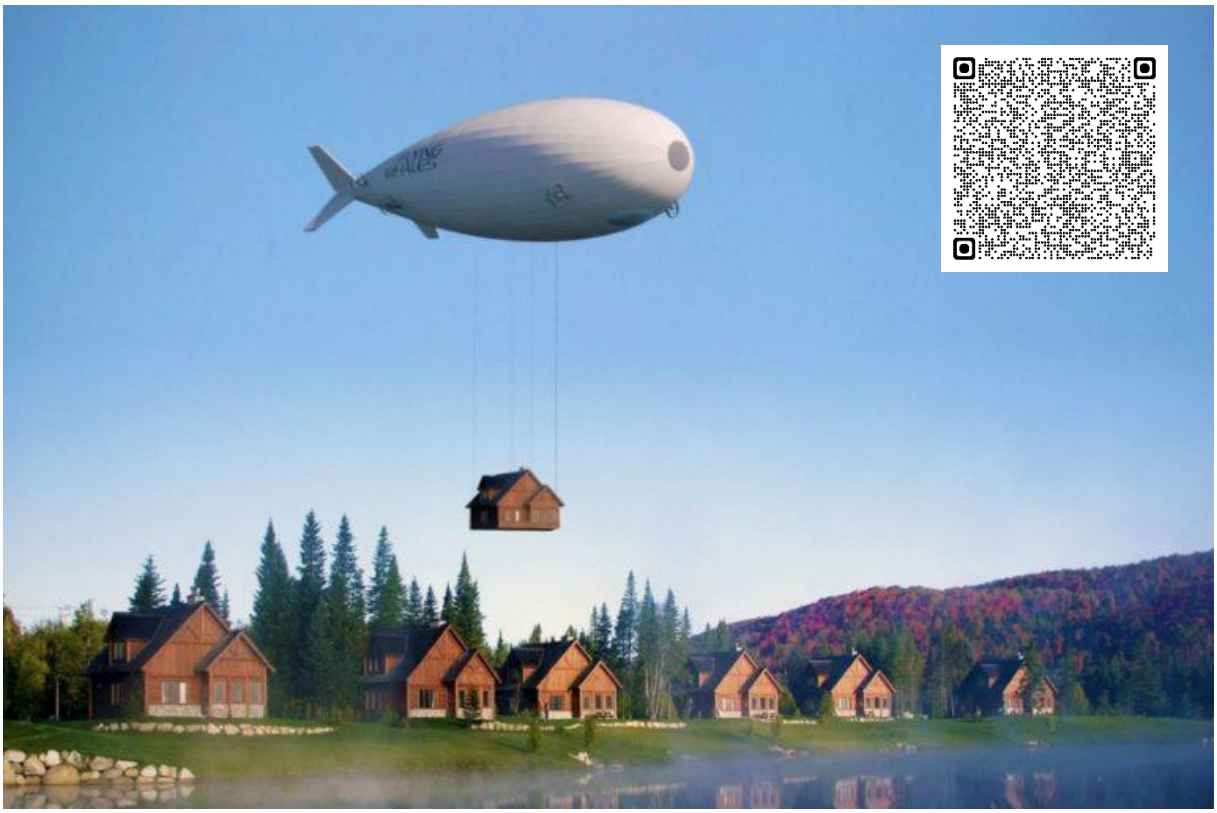
Subjects of the Month:

Dirigeable : ce mode de transport plus «durable» que l'avion pourrait-il connaître un nouvel âge d'or ?



Depuis quelques années, le dirigeable connaît un regain d'intérêt pour le transport de fret. Plusieurs projets sont en cours de développement. Parmi ceux-ci, celui de Flying Whales, une entreprise établie en Gironde, est le centre de beaucoup d'attention.

Alors qu'il a été relégué aux oubliettes pendant plusieurs décennies, la saturation du trafic routier et les défis environnementaux risquent bien de redonner au dirigeable ses lettres de noblesse. Silencieux, relativement rapide, pouvant transporter de lourdes charges, peu émetteur de CO2, le dirigeable est-il en train de s'envoler vers un nouvel âge d'or ?

Coup d'oeil dans le rétroviseur

C'est en 1884 que fut construit par deux Français, Charles Renard et Arthur Constantin Krebs, le premier dirigeable fonctionnel. Celui-ci se déplaçait grâce à une hélice à propulsion électrique de 9 chevaux, et pouvait atteindre la vitesse de 24 km/h.

D'autres dirigeables furent ensuite développés, mais il a fallu attendre 1909 pour qu'ait lieu, grâce à l'ingénieur allemand Ferdinand Von Zeppelin, le premier transport de passagers par dirigeable.

En 1928 fut inauguré le « Graf Zeppelin », un énorme dirigeable de 236 mètres de long, qui pouvait traverser l'Atlantique en trois jours seulement, soit deux fois plus vite qu'un bateau.

Le Graf Zeppelin assura 590 vols, dont un tour du monde et 143 traversées de l'Atlantique. L'aventure de cette géniale invention se termina dramatiquement en 1937 lorsque le Zeppelin LZ 129 Hindenburg, rempli d'hydrogène, explosa au moment d'atterrir à Lakehurst dans le New Jersey, causant la mort de 36 passagers. Cette catastrophe mit fin aux vols de dirigeables commerciaux.

Le secteur du transport sur la sellette

Depuis les Accords de Paris de 2015, la réduction de nos émissions de CO2, tous secteurs confondus, est devenue une nécessité impérative. Or le secteur des transports, à lui seul, représente 25% des émissions globales de dioxyde de carbone. Pire encore, c'est le seul secteur dont les émissions continuent de croître, avec plus de 15 gigatonnes de CO2 émis annuellement dans le monde.

Depuis plusieurs années, d'intenses recherches sont dès lors menées et de lourds investissements consentis pour décarboner à pas de charge tant les moyens de transport particuliers que la mobilité lourde (trains, bus, bateaux et avions). Propulsion électrique, carburants alternatifs et moteurs à hydrogène promettent tous d'apporter leur pierre à l'édifice de la décarbonation, car les perspectives de croissance du secteur des transports donnent le vertige. Un doublement du nombre d'avions pour le transport de passagers est annoncé d'ici à 2040, et le transport de fret par les airs devrait connaître un développement encore plus important.

Un leader mondial français

Depuis le Salon du Bourget de 2019, une entreprise française fait parler d'elle. : Flying Whales, détenue à 30% par la Région Nouvelle-Aquitaine, à 25% par le gouvernement du Québec et à 25% par l'avionneur chinois Avic. Elle ambitionne de devenir le leader mondial des fabricants de dirigeables destinés au transport de fret.

Créée en 2012, cette startup tricolore va construire sa première usine de fabrication à Laruscade, à 43 kilomètres de Bordeaux, en Gironde. Elle devrait lancer dès 2024 la plus grosse « baleine volante » du monde : un dirigeable de 200 mètres de long et 50 mètres de diamètre, baptisé LCA60T, abréviation de Large

Capacity Airship 60 Tonnes. L'actionnariat québécois permettra, entre autres, la construction, dès 2022, d'une usine de fabrication au Québec, destinée à desservir le marché nord-américain à partir de 2024.

Le concept à l'origine de Flying Whales est né d'une réflexion avec l'ONF (Office National des Forêts) qui cherchait une solution pour le débardage et le transport de grumes dans des zones inaccessibles comme les Alpes françaises. Sébastien Bougon, le PDG de l'entreprise, s'est attelé depuis 2012 à développer un dirigeable qui pouvait répondre à cette contrainte. Outre le faible impact carbone de ce mode de transport, l'énorme avantage du dirigeable est de pouvoir charger et décharger sa cargaison en vol stationnaire, contrairement à l'hélicoptère qui ne peut transporter qu'un maximum de 5 tonnes à la fois, et doit atterrir pour réaliser la manœuvre.

Autour du dirigeable, c'est tout un nouveau secteur économique qui peut se développer, car il faudra de nouvelles infrastructures pour accueillir, charger et décharger les aéronefs, des centres logistiques, un institut météo, une école pour la formation des pilotes, etc.

Le LCA60T de Flying Whales sera doté d'une technologie dernier cri. Avec ses quatre turbines de 1 MW à propulsion hybride, le dirigeable émettra 50 fois moins de CO2 et 50 fois moins de particules fines qu'un avion. A terme, Sébastien Bougon compte bien remplacer les turbines thermiques par des piles à hydrogène, et arriver ainsi à son objectif de 100% d'énergie renouvelable.

Une foule d'applications possibles

Les débouchés qu'offre le dirigeable sont nombreux et variés : du transport de bois en passant par les pales d'éoliennes, les pylônes électriques, le transport de maisons en bois ou celui de passagers.

Ainsi la société CNIM Air Space, établie à 25 kilomètres au sud de Toulouse, a mis au point pour RTE le Diridrone, un dirigeable piloté depuis le sol comme un drone.

Véritable concentré de technologie, la mission du Diridrone est simple : acquérir des données grâce à un double capteur photo asservi sur la position des câbles de haute tension.

Outre le fait que ce dirigeable permettra de modéliser en 3D toutes les infrastructures de transport d'électricité, le Diridrone pourra détecter automatiquement certaines anomalies matérielles et surveiller l'état des câbles à haute tension de la RTE.

L'engin permettra de moderniser et d'automatiser les moyens aériens de la RTE, qui utilise jusqu'à ce jour sept hélicoptères pour assurer la surveillance du réseau.

En Belgique, la société Fly Win, créée en 2013 par Laurent Minguet, voudrait aussi se lancer dans le transport de fret par dirigeable. En se basant sur un travail universitaire, cet homme d'affaire était arrivé à la conclusion que le transport de marchandise par dirigeable coûterait environ 7 centimes par tonne et par kilomètre au lieu de 22 centimes pour le même service effectué par avion. Et ceci, sans compter sur les bénéfices en termes d'empreinte carbone.

Le projet développé par Fly Win consiste à se passer de pilote et d'évoluer à une altitude de 20 km, dans la partie basse de la stratosphère, au-dessus des routes empruntées par les avions.

Le vol du premier prototype n'a toutefois pas été concluant et l'entrepreneur, qui ne compte pas baisser les bras s'est lancé à la recherche de nouveaux financements pour poursuivre le développement du projet.

Et la sécurité ?

Tout le monde a en tête l'image du Zeppelin Hindeburg qui a explosé en 1937 dans le New Jersey. A l'époque, ces aéronefs étaient gonflés à l'hydrogène, un gaz hautement inflammable. Aujourd'hui, la plupart des dirigeables sont gonflés à l'hélium, un gaz inerte, donc incombustible et non-toxique.

Le vent, principal ennemi du dirigeable

Le dirigeable peut résister aux pluies, aux orages et à la grêle, mais son véritable ennemi est le vent. Transporter des marchandises depuis Bordeaux pourra se faire fréquemment, mais faire revenir les ballons de Nantes risque d'être plus aléatoire. Selon les experts de la filière, les dirigeables, qui se déplacent à une vitesse de 100 km/heure, pourront voler entre 200 et 300 jours par an.

Si les atouts de ce mode de transport sont indéniables, certains doutent de son succès. Le concept n'est pas neuf et de nombreuses tentatives se sont soldées par des échecs du fait de la trop forte sensibilité du dirigeable aux aléas du vent, et à sa vulnérabilité, laquelle pourrait compromettre une utilisation fiable et sécurisée. Il reste à espérer que les développements technologiques permettront de contrer ces points faibles et de trouver les bons couloirs de vent.

What about this month:

EASA publishes practical scenario on crew skill decay to support the Return to Normal Operations

In July 2020, EASA published guidelines on the importance of resilient 'air operators' management systems in the COVID-19 recovery phase, which were complemented by three practical operational scenarios.

EASA has now developed an additional scenario addressing the issue of crew skill decay.

This scenario was reviewed and agreed with a task force composed of representatives of EASA, authorities and airlines.

This practical scenario supports the air operators in developing their comprehensive risk assessments to resume normal operations and monitor the assurance of safety by providing information on possible hazards, threats and consequences, and by suggesting mitigation measures.

Guidelines: The role of operators' management systems in the COVID-19 recovery phase

The European Union Aviation Safety Agency (EASA) is working closely with Member State regulators and industry partners to identify the new or emerging safety issues arising from COVID-19.

In order to support the safe return to normal operations (RNO), a document on "The role of air operators' management systems in the COVID-19 recovery phase" has been developed as part of the basket of measures the Agency is assembling as a response to the crisis.

These guidelines address the air operators to identify and consider safety threats associated with RNO. They have been developed by a team of subject matter experts from EASA, industry and national competent authorities, appointed by the RNO Taskforce.

More specifically, the document enhances the needed robustness and resilience of the air operator's management system in order to identify and mitigate COVID-19 generated risks, by outlining the importance of:

- The safety risk management process;
- The compliance monitoring function;
- The safety performance monitoring and measurement;
- The management of changes.

The guidelines further focus on operational and airworthiness aspects, taking into consideration organisational and human factor elements.

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These guidelines are the core document and are complemented by a number of practical safety scenarios with hazards, consequences and possible mitigations.

These scenarios take into account relevant safety issues outlined in the Agency COVID-19 Risk Portfolio; more will be published individually as they become available.

The proposed mitigation measures are in no case binding because the situation may significantly vary from one airline to another; it is the ultimate responsibility of the air operator to assess whether the suggested measures are relevant, appropriate or effective.

EUROCONTROL Forecast Update 2021-2027

European Flight Movements and Service Units - Three scenarios for recovery from COVID-19

This forecast contains three scenarios and both the 'baseline' and 'high' scenarios show recovery to 2019 levels during the course of 2023, while this is delayed in the 'low' scenario until 2027.

It updates and extends the forecast made in May 2021, before the summer season.

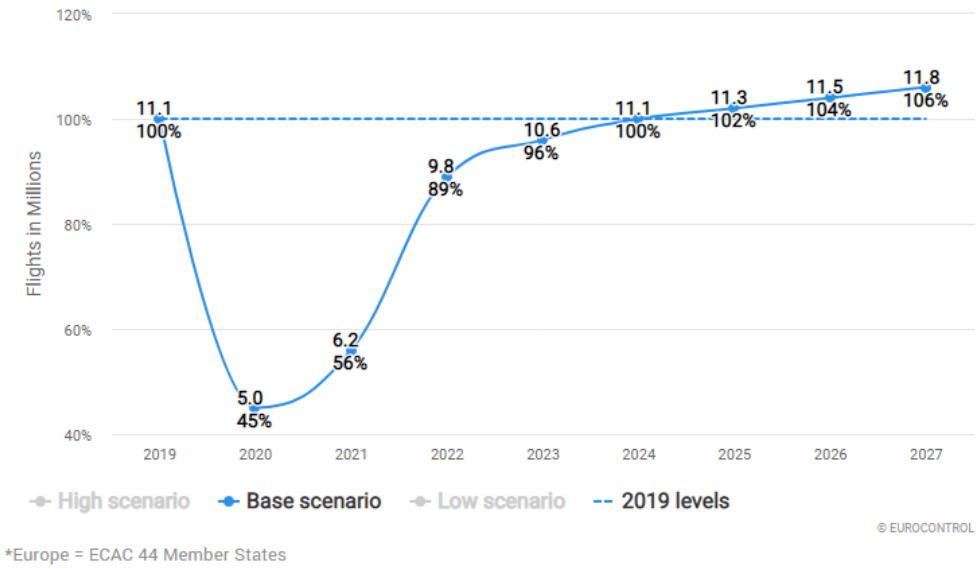
The High scenario envisages the vaccination campaign continuing both within Europe and globally, with reliable vaccines that continue to be effective, including against variants. With a coordinated interregional approach, travel restrictions are relaxed, with most inter-regional flows restarting by the middle of 2022. Business travel recovers quickly in this scenario.

The Baseline scenario is similar but with flows outside Europe recovering rather more slowly (partly as the result of a lack of a coordinated inter-regional approach) and with business travel only recovering to pre-COVID levels in 2023.

The Low scenario considers the impact of several downside risks, such as slow/patchy vaccination rates, the need for new vaccines as a result of variants, the reintroduction of lockdown and similar measures, the continuation or re-imposition of travel restrictions, economic risks, including high energy prices and a long term drop in people's propensity to fly.

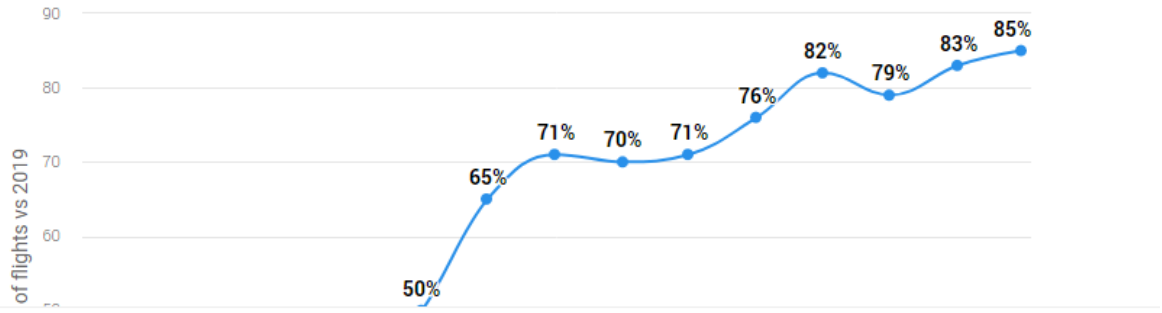
EUROCONTROL 7-year forecast for *Europe 2021-2027

Actual and future IFR movements, % traffic compared to 2019



The traffic figures refer to the number of flights, including both passenger and cargo. Recent experience has been that the recovery in the number of passengers is lagging behind the increase in the number of flights.

These scenarios were also used to revise and extend the monthly forecast produced in June 2021. This new monthly forecast shows a continuation of recent positive trends, in particular during the holiday period in December 2021.



See attached

European Union and African Union strengthen partnership in civil aviation safety

With the aim to enhance aviation safety in Africa, the EU-Africa Safety in Aviation (EU-ASA) project has been launched. This € 5 million technical assistance initiative is managed by the European Union Aviation Safety Agency (EASA) under the umbrella of the Africa-EU Partnership and the Africa-Europe Alliance for Sustainable Investment and Jobs. In the next three years, the project will assist African member states to establish an effective aviation safety oversight system. The EU-ASA project comes at the right time with

the establishment of the Single African Air Transport Market (SAATM) which is one of the 12 flagship projects of the African Union Agenda 2063.

The project includes a set of activities that will provide support on three levels: continental, regional and national. The main goals of the project are to strengthen Regional Safety Oversight Organisations (RSOOs) and assist African States to meet their obligations under the Chicago Convention to establish an effective aviation safety oversight system. This will also contribute to the implementation of the pillar of the SAATM on 'Enhancing Safety and Security'. The main beneficiaries will be the African Civil Aviation Commission (AFCAC), the African RSOOs and Regional Accident and Incident Investigation Organisation (RAIO). Direct assistance to some specific African states will also be provided.

Plane carrying squad of Russian paratroopers crashes, killing 19 passengers and injuring three

- Nineteen feared dead after a plane carrying paratroopers crashed in RussiaAn L-410 plane carrying 21 parachutists crashed near Menzelinsk in Tatarstan
- The Emergencies Ministry confirmed there were 23 people on board

Nineteen people are feared dead after a plane carrying a squad of paratroopers crashed in eastern Russia on Sunday.

An L-410 plane carrying 21 parachutists and two crew members crashed near Menzelinsk in the region of Tatarstan, Interfax said.

In a statement, the Emergencies Ministry said: 'Fire and rescue units are at the scene, there are 23 people on board, three people have been rescued, further rescue operations are underway.'

This is a breaking news story. More to follow

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An L-410 plane carrying 21 parachutists and two crew members crashed near Menzelinsk in the region of Tatarstan, Interfax said

Eight dead in Milan plane crash: Private plane 'carrying French passengers' smashes into empty office building in suburbs killing everyone on board 'including boy'

- Plane carrying six passengers and two crew members crashed in Milanese suburb of San Donato earlier today
- The private aircraft hit a vacant two-story building in the Milan suburb killing everyone onboard, reports said
- Firefighters have said no one other than those onboard the plane were involved in the early afternoon crash

A small private plane carrying six passengers and two crew members crashed into a vacant, two-story office building in a Milan suburb, killing everyone on board.

The LaPresse news agency initially quoted firefighters at the scene saying the pilot and all five passengers aboard were killed.

But later LaPresse and other media said there were eight people aboard the flight, including a boy.

Rai state TV said the passengers were believed to be French.

A small plane has crashed killing eight people, including six passengers and two crew members, in Milan, Italy. Pictured: Firefighters work at the building on which a small private plane crashed into the San Donato Milanese district in Milan.

Fire officials couldn't immediately be reached to confirm the nationalities or the number of people aboard the plane.

Firefighters tweeted that no one other than those aboard were involved in the early afternoon crash near a subway station in San Donato Milanese, a small town near Milan.

They said several cars in a nearby parking lot were set ablaze, but apparently the vehicles were unoccupied at the time.

A thick column of dark smoke rose from the crash site and was visible for kilometers.

Firefighters were extinguishing the flames of the now-charred building, which reportedly was under renovation.

Sky TG24 said the plane was flying between Milan's Linate airport and the Italian island of Sardinia.

This is a breaking news story. We will bring you more information as soon as it becomes available.

Travelcare for travelers and crewmembers

ICAO or FAA

European Advice

French Advice (in French)

Une compagnie aérienne abandonne jupes et talons des hôtesses pour pantalons et baskets

SkyUp Airlines, une compagnie aérienne ukrainienne, a décidé de mettre fin au traditionnel uniforme des hôtesses de l'air, comprenant jupes et talons. Ce sera désormais pantalons amples et baskets ! Bon, les vêtements resteront orange…

SkyUp Airlines, une compagnie ukrainienne privée, a décidé de mettre fin aux talons et aux jupes crayon, après avoir recueilli des commentaires des hôtesses de l'air sur leur uniforme. Leur nouvel uniforme, qui sera lancé officiellement le 22 octobre, est désormais composé de baskets blanches et d'un costume orange ample avec un pantalon et une écharpe en soie, tous deux fabriqués par des marques ukrainiennes. Des t-shirts blancs remplaceront les chemisiers.

« Les chaussures à talons sont belles, je ne le conteste pas, mais les pieds souffrent et enflent à la fin du vol. Les baskets sont absolument cool, a déclaré Alexandrina Denysenko, hôtesse de l'air de la compagnie à l'agence de presse Reuters. Si un équipage doit faire un atterrissage dans l'eau et une évacuation, les talons peuvent endommager l'échelle et il ne sera pas très confortable de nager en jupe. »

La compagnie a déclaré avoir fait des recherches sur l'histoire des uniformes du personnel de cabine et avoir décidé d'abandonner ce qu'elle appelle les éléments « conservateurs » du look d'un agent de bord. Des tresses remplaceront désormais un chignon serré ou une queue-de-cheval. « Le travail d'une hôtesse de l'air n'est pas si romantique. C'est dur », explique Marianna Grygorash, responsable du marketing de SkyUp à la chaîne de télévision britannique BBC . « Nous avons compris que nos hôtesses de l'air ne voulaient pas être perçues comme sexualisées et enjouées. »

Des traditions sexistes en voie d'abandon

« L'image typique d'une hôtesse de l'air est probablement plus sexualisée et associée à la féminité que toute autre », explique également Olena Strelnyk, spécialiste des questions de genre, à la BBC. Et c'était particulièrement le cas en Ukraine, où le stéréotype a longtemps été celui de femmes plus axées sur leur apparence physique que les femmes occidentales. Selon la spécialiste, la donne serait en train de changer, l'Ukraine commençant à se défaire de nombre de ses traditions sexistes.

Marianna Grygorash a indiqué que la compagnie prévoyait également de lancer un nouvel uniforme pour l'équipage masculin. Un costume léger au lieu d'un gilet, et un T-shirt au lieu d'une chemise seront combinés avec des baskets noires.

Other purposes

British Airways tells pilots and cabin crew not to refer to passengers as 'ladies and gentlemen' in favour of gender-neutral terms to celebrate 'diversity and inclusion'

- British Airways has adopted more gender-neutral terms to greet passengers
- Other major airlines like easyJet have already adopted gender-neutral language
- Japan Airlines used gender-neutral terms in 2020 for 'positive atmosphere'

British Airways has instructed pilots and cabin crew not to refer to passengers as 'ladies and gentlemen' in an effort to celebrate 'diversity and inclusion'.

Britain's flagship carrier has abandoned the greeting in favour of more gender-neutral terms, reportedly to respect wider social norms and make children feel included.

Other major airlines, including Lufthansa, easyJet and Air Canada, have already adopted gender-neutral language.

Japan Airlines began using gender-neutral terms last year to 'create a positive atmosphere and treat everyone… with respect'.

The Australian airline Qantas launched its 'Spirit of Inclusion' initiative in 2018 to encourage staff to refrain from using gender-specific terms, while US carrier Delta Air Lines is soon to start using such greetings during onboard announcements to create 'a safe, comfortable and respectful space for all of our customers and employees'.

BA faced criticism this summer after axeing the drinks trolley and instead asking short-haul, economy-class flyers to pre-order or use an app – similar to those in Wetherspoon pubs – if they want a drink.

The airline said the move was to cut down on weight and food waste, but critics have complained that the lack of personal touch was an example of the nation's flag carrier running down its services.

A BA spokesman said: 'We celebrate diversity and inclusion and we're committed to ensuring that all our customers feel welcome when travelling with us.'

Sir Martin Sorrell, founder of the advertising agency WPP, told The Sunday Telegraph that passengers are no longer bothered by the use of traditional greetings.

'Whether that's fortunate or unfortunate, it's a sign of the times,' he said.

Environment

Français

Quels sont les facteurs d'influences clés associés au développement de la mobilité hydrogène ?

Par Romain Dominique et Antoine Trochon, consultants énergie chez Wavestone et contributeurs du blog EnergyStream

L'hydrogène est un levier en regard des enjeux de décarbonation du secteur industriel. Cependant, l'Industrie n'est pas le seul secteur à être fortement émetteur de carbone. Les transports représentaient par exemple, en 2019, 31% des émissions de GES (+9% par rapport à 1990) en France. Plus globalement, le verdissement des solutions de mobilités (en particulier urbaines & routières) est aujourd'hui un axe prioritaire des stratégies européennes de décarbonation.

Quels sont les facteurs d'influences clés associés au développement de la mobilité hydrogène ?

Dans ce contexte, l'hydrogène apparait une nouvelle fois comme un vecteur énergétique en mesure de réduire les émissions carbones liées à la mobilité, à travers divers cas d'usages : urbains (bus, flottes captives), routiers (camions, autocars longue distance), ferroviaires (trains régionaux) et maritimes (transports fluviaux, etc.). De nombreuses initiatives et écosystèmes se créent autour de l'hydrogène en France pour accélérer le passage à l'échelle des projets associés à la mobilité.

Néanmoins, de nombreux facteurs d'influence subsistent et jouent un rôle clé dans le développement de la filière. En s'appuyant sur le PESTEL ci-dessous, nous vous proposons une revue de ces facteurs d'influence :

Les facteurs d'influences présentés dans le PESTEL peuvent être répartis en deux catégories : les facteurs clés qui permettront l'émergence de la filière et les facteurs transverses qui seront considérés comme des facilitateurs.

Politique

En 2020, l'Etat français a présenté sa stratégie pour "le développement de l'hydrogène décarboné" (détaillée dans l'un de nos précédents articles) dans le but d'étendre les initiatives à un niveau national et accélérer la création d'une filière française. Comme de nombreux pays européens, la France donne désormais un cadre à la filière hydrogène avec des axes stratégiques ambitieux, notamment celui d'accélérer le déploiement de la mobilité hydrogène (en particulier la mobilité dite « lourde »).

Ainsi, 27% des 3,4 milliards d'euros prévus d'ici 2023, seront dédiés au développement technologique et économique de la mobilité hydrogène.

Ces dernières années, les régions ont amorcé leurs stratégies en matière de développement de la filière hydrogène, à travers notamment la mise en place d'écosystèmes territoriaux.

La Région Auvergne-Rhône-Alpes a par exemple lancé son projet Zero Emission Valley en 2017 avec pour objectif de promouvoir le potentiel de décarbonation de l'hydrogène pour la mobilité (objectif d'implémenter 20 stations de recharge et de déployer une flotte de 1000 véhicules).

Ce projet matérialise parfaitement la notion de création d'écosystèmes car il mobilise diverses sources de financements d'acteurs positionnés sur l'ensemble de la chaîne de valeur de l'hydrogène.

La mise en place d'une politique commune française autour de l'hydrogène est donc primordiale pour garantir une cohérence dans les initiatives mais également pour assurer la déclinaison opérationnelle de la stratégie au sein des différentes régions.

Technologique

Maillon essentiel de la chaîne de valeur, la technologie de l'électrolyse est aujourd'hui clé pour confirmer le potentiel de l'hydrogène renouvelable.

D'un point de vue usage, la pile à combustible permet de créer de l'électricité grâce à l'hydrogène stocké, elle peut être utilisée sur la plupart des moyens de transports.

De nombreux projets travaillent actuellement à améliorer les composants nécessaires aux multiples cas d'usages de la mobilité hydrogène.

A titre d'exemple, Energy Observer, ce bateau de course reconverti en laboratoire flottant, traverse les océans pour tester et démontrer les possibilités offertes par un usage de l'hydrogène en autonomie.

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D'autre part, la région Bourgogne-Franche-Comté a annoncé le lancement de son écosystème hydrogène marqué par une commande de trains hydrogène pour son réseau TER.

Le ferroviaire représente aujourd'hui une part importante des moyens de transports utilisés par les Français, notamment pour les trajets interrégionaux.

Avec le Coradia iLint, train déjà en circulation en Allemagne et ayant récemment fait ses premiers essais en France, l'hydrogène se fait une place dans le monde du transport ferroviaire. De la même manière, le projet Mission H24 vise à introduire des voitures hydrogène aux 24h du Mans pour pousser les constructeurs à développer des technologies utilisant l'hydrogène.

Afin d'accompagner les acteurs dans le développement des technologies hydrogène (production et usages, en particulier pour la mobilité) et de faciliter l'expérimentation, la stratégie 2020 s'appuie sur un Appel à Projets « Briques technologiques et démonstrateurs hydrogène », bénéficiant d'une dotation de 350 millions d'euros jusqu'à 2030.

Le développement de composants performants et fiables à grande échelle est essentiel pour permettre de faciliter les usages de l'hydrogène pour tous les moyens de transports. C'est en garantissant une fabrication industrielle et une exploitation des véhicules hydrogène compétitive que les constructeurs pourront être attractifs auprès de futurs utilisateurs.

Économique

La pérennisation de la filière et de ses usages exige que les acteurs qui la composent trouvent un modèle économique performant.

Les investissements lourds à réaliser peuvent être soutenus par des mécanismes de financement comme les grands programmes européens (LIFE, Innovation Fund, Connecting Europe Facilities, etc.), les Appels à Projets (AAP) territoriaux et nationaux ou encore via le biais de fonds d'investissements et autres structures publiques/privées. Mais dès cette phase de développement des outils industriels, chacun doit trouver sa place et s'adapter aux besoins de sa chaine de valeur.

Le projet HyAMMED est construit sur cette conviction. Le projet a pour but de créer une station de rechargement de camions. Il est conduit par Air Liquide ainsi que le constructeur Iveco, le transporteur Jacky Perrenot, et les sociétés Carrefour et Coca-Cola.

Comme tout marché qui se crée, le développement de la filière hydrogène est intimement lié au potentiel d'investissement et au cadre économique qui lui sont associés.

Il est donc essentiel de bénéficier des bons mécanismes de financement pour mener les projets à l'industrialisation mais également pour optimiser les technologies et infrastructures afin d'assurer une rentabilité à long terme.

Autres facteurs transverses ayant un impact sur la création d'écosystèmes de mobilité hydrogène

Sociologique – Ecologique – Légal

Le déploiement de solutions de mobilité hydrogène nécessite un contexte porteur. Les exigences des utilisateurs finaux, la mise en avant du potentiel de décarbonation de l'hydrogène ou encore la création d'un cadre légal sont autant de facteurs transverses qui peuvent favoriser le développement de l'hydrogène dans la mobilité.

L'acceptation sociale reste une nécessité pour entériner le développement des usages associés à l'hydrogène. Il faut donc mettre en place les bons mécanismes pour rassurer les utilisateurs finaux sur le potentiel de l'hydrogène et la fiabilité des technologies associées.

D'autre part, afin de créer des écosystèmes autour de l'hydrogène, en mobilisant diverses typologies d'acteurs, il est important de convaincre sur le potentiel de décarbonation de l'hydrogène renouvelable.

La majeure partie de la production actuelle d'hydrogène appartient à une filière historique marquée par une forte empreinte carbone liée aux procédés de production et de consommation de l'hydrogène carboné (dit « gris »).

Il est donc important d'acculturer et promouvoir le développement de l'hydrogène renouvelable (dit « vert ») ou bas-carbone (dit « bleu ») pour les applications finales, en particulier la mobilité. La stratégie 2020 de la France prévoit notamment la mise en place de parcours de formation et de montée en compétences dédiés à l'hydrogène (au sein des lycées, universités, etc.).

Enfin, comme c'est aussi le cas pour de nombreux usages dans la mobilité, la filière hydrogène doit bénéficier d'un cadre légal complet et partagé pour assurer son développement.

Tant sur la fabrication que sur l'exploitation de systèmes de mobilité à hydrogène, il est primordial pour les acteurs de partager des normes et une législation commune, en France comme en Europe, qui donnent un cadre et une existence juridique au développement technologique et à la constitution d'un marché sur le plan économique.

La mobilité hydrogène sera l'un des sujets phares du congrès Horizons Hydrogène

Tout comme les sujets liés à la décarbonation de l'Industrie, le prochain Congrès Horizons Hydrogène (29 et 30 novembre 2021 au Pullman Paris Centre Bercy), dont WAVESTONE est Business Partner (et Le Monde de l'énergie partenaire média), traitera les thématiques autour de la mobilité hydrogène.

Cette session d'échange permettra d'aborder les questions clés concernant le potentiel de décarbonation de l'hydrogène pour la mobilité, face à d'autres alternatives énergétiques, ainsi que la création d'écosystèmes territoriaux permettant d'accélérer le déploiement des technologies.

De plus, l'objectif du Congrès Horizons Hydrogène sera également de mettre en lumière de nombreux projets français, européens et internationaux (notamment des projets de mobilités hydrogène) à travers des sessions dédiées. D'autres espaces du salon seront consacrés à des ateliers de formations (financement, etc.) ou encore à des démonstrations de technologies hydrogène.

English

ICAO welcomes the air transport industry's new net-zero 2050 commitment

Home (atag.org)

ICAO's Council President and Secretary General have welcomed the timely and ambitious target adopted by the international air industry today to achieve net-zero carbon emissions by 2050.

In a declaration released today by the Air Transport Action Group (ATAG), the air industry sector committed that "global civil aviation operations will achieve net-zero carbon emissions by 2050, supported by accelerated efficiency measures, energy transition and innovation across the aviation sector and in partnership with Governments around the world."

"The latest IPCC reports are unequivocal about the threats now posed to humanity by climate change, and I'm sure that all ICAO Member States join me today in welcoming this latest and very ambitious net-zero 2050 target adopted by the air transport industry so that our global sector will continue to do its part," commented ICAO Council President Salvatore Sciacchitano.

The President's sentiments were echoed by ICAO Secretary General Juan Carlos Salazar, who stressed ICAO's congratulations to the airline and airport operators, aircraft manufacturers, air navigation service providers, and many other industry stakeholders involved in adopting this critical and ambitious long-term climate goal.

The air industry net-zero 2050 announcement comes just days after the very strong statement on behalf of G7 transport and health ministers to work with greater determination together to promote the safe and sustainable reopening of international travel.

FAA regulations

Draft ACs

NONE

Advisory Circular

NONE

Forms - Orders & Notices

Document Title:	Order 8900.1 CHG P129A001 and Notice 8900.P129A001
Summary:	**Order 8900.1 CHG P129A001**: This change incorporates Notice N 8900.524, Updated 14 CFR Part 129 Guidance for OpSpec A001, Issuance and Applicability, and Reports, dated September 30, 2019, into OpSpec A001, addressing Department of Transportation (DOT) terminology changes. This change incorporates new information into Volume 11, Chapter 6, Section 4 and Volume 12, Chapter 4, Section 2. **Notice 8900.P129A001**: This notice announces an update to authorized operations in OpSpec A001, issued for operations conducted under 14 CFR part 129. This notice includes revised FAA Order 8900.1 guidance for the OpSpec. The OpSpec revision is nonmandatory and applies to part 129 foreign operators only.
Documents for Download:	Draft Order (PDF) Draft Notice (PDF) Draft Document Comment Grid (MS Word)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 61, Certification: Pilots, Flight Instructors, and Ground Instructors • Part 91, General Operating and Flight Rules • Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations • • Part 129, Operating Requirements: Domestic, Flag, and Supplemental Operations • Part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft.

Document Title:	Order 8900.1 CHG P129A001 and Notice 8900.P129A001
	• Part 212, Charter Rules for U.S. and Foreign Direct Air Carriers • Part 294, Canadian Charter Air Taxi Operators
Comments Due:	November 3, 2021
How to Comment:	**Email comments to:** Email Comments
Document Title:	**Order 8000.95B, Designee Management Policy**
Summary:	This order is a comprehensive publication establishing policy and procedures for managing all aspects of certain representatives of the Administrator including selection, appointment, orientation, training, oversight, suspension, and termination. This order represents a consolidation of existing policies across Aviation Safety (AVS) Services and Offices: Aircraft Certification Service (AIR), Flight Standards Service (FS), and the Office of Aerospace Medicine (AAM). This order also establishes the Designee Management System (DMS), which is a web-based tool designed to standardize the management of designees.
Documents for Download:	Draft Order (PDF) Draft Document Comment Grid (MS Word)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 21, Certification Procedures for Products and Articles • Part 61, Certification: Pilots, Flight Instructors, and Ground Instructors • Part 63, Certification: Flight Crewmembers Other Than Pilots • Part 65, Certification: Airmen Other Than Flight Crewmembers • Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations • Part 141, Pilot Schools • Part 142, Training Centers • Part 147, Aviation Maintenance Technician Schools

Document Title:	Order 8000.95B, Designee Management Policy
	• Part 183, Representatives of the Administrator
Comments Due:	November 19, 2021
How to Comment:	**Email comments to:** Email Comments

EASA regulations

Approval Data Library | EASA (europa.eu)

Rules

Regulations | EASA (europa.eu)

Easy access Rules

Agency Decisions

Overview | EASA (europa.eu)

Notices of Proposed Amendment

Notices of Proposed Amendment (NPAs) | EASA (europa.eu)

NPA 2021-11

The purpose of this Notice of Proposed Amendment (NPA) is to provide proportionate and cost-efficient rules in the field of the safety assessment provisions for equipment, systems and installations for rotorcraft that also maintain an overall high level of safety. In addition, the intent of this NPA is also to increase harmonisation of the safety assessment provisions for rotorcraft with their Federal Aviation Administration (FAA) equivalents.

The application of stringent safety objectives to simpler small rotorcraft creates a barrier to innovation and the installation of systems and equipment, which could improve the overall safety of these aircraft. This is due to the higher and sometimes prohibitive costs of developing systems and equipment to meet the stringent safety objectives and the costs of certification. It is often the case that due to the high costs of certification the economic justification or business case would not support the introduction of safety-enhancing equipment.

This NPA proposes a solution to the above by introducing proportionality in the safety assessment objectives for the design of rotorcraft systems and equipment and the methodology that is used to identify the presence of hazards in the design. A similar approach has been introduced by the Federal Aviation Administration (FAA) through a Policy Statement.

In addition, this NPA contains proposals that improve the clarity of the requirements for electrical installations for CS-29 rotorcraft that were previously included in the safety assessment provisions.

Opinion No 05/2021

Part 21 Light — Certification and declaration of design compliance of aircraft used for sport and recreational aviation and related products and parts, and declaration of design and production capability of organisations

The objective of the proposed 'Part 21 Light' is to provide cost-efficient and proportionate rules in the field of the initial airworthiness of aircraft used for sport and recreational aviation.

Compared to Part 21, the proposed 'Part 21 Light' provides a lighter approach to the certification of those general aviation aircraft, and introduces the possibility for a declaration of design compliance to be submitted as an alternative to certification. The proposed 'Part 21 Light' also provides for the possibility to demonstrate design and production capabilities through a declaration, instead of an approval, and for certain low-risk production activities the demonstration of production capabilities is not required at all.

The Opinion captures the outcome of a series of focused consultation workshops that have been used by the Agency to develop this Opinion. Furthermore, following consultation of the draft Opinion with the Advisory Bodies, the regulatory text of 'Part 21 Light' has been further refined to accommodate concerns about proportionality (e.g. removal of safety management elements).

With these new possibilities, it is expected that the barriers to the entry into the European regulatory system will be lowered while maintaining aviation safety. This is expected to invigorate and stimulate the general aviation sector and permit the easier development of new aircraft types.

The proposed 'Part 21 Light' and related amendments of existing Regulations are expected to reduce the regulatory burden for the designers and manufacturers of aircraft used for sport and recreational aviation while continuing to ensure a high level of safety.

ASECNA

AIP ASECNA

Regulations

- AIC NR 34/A/21GO - October 31, 2021 - DIAP - ABIDJAN (IVORY COAST) - Assistance protocol for wildlife hazard management
- AMDT 11/2021 - October 29, 2021 - Updating bulletin
- SUP NR 100/A/21GO - October 28, 2021 - DXXX - LOME (TOGO) - Apron SIERRA reinforcement works
- AIC NR 33/A/21GO - October 27, 2021 - DAKAR NOF (ASECNA) - Implementation of the Global Reporting Format (GRF) in ASECNA members states
- SUP NR 66/A/21FC - October 27, 2021 - FKYS - YAOUNDE NSIMALEN (CAMEROON) - Update of aeronautical information
- AIC NR 12/A/21FM - October 26, 2021 - ANTANANARIVO NOF (ASECNA) - Implementation of the Global Reporting Format (GRF) in ASECNA members states
- SUP NR 99/A/21GO - October 22, 2021 - DRRN - NIAMEY (NIGER) - Update of RNAV and ILS instrument approach procedures aligned on the VOR and ILS new positions
- SUP NR 65/A/21FC - October 22, 2021 - FC - CONGO - Publication of regulated charges applicable to the airports
- SUP NR 98/A/21GO - October 18, 2021 - DXXX - LOME (TOGO) - Aeronautical datas update
- SUP NR 97/A/21GO - October 18, 2021 - DXXX - LOME (TOGO) - Aerodrome obstacles update
- SUP NR 64/A/21FC - October 18, 2021 - FCBB - BRAZZAVILLE (CONGO) - Update of aeronautical information
- AIC NR 31/A/21GO - October 14, 2021 - DAKAR NOF (ASECNA) - Air traffic services procedures developed for ASECNA support to air users during COVID-19 pandemic
- SUP NR 14/A/21FM - October 14, 2021 - MADAGASCAR NOF - Checklist of valid AIP supplements "A"
- AIC NR 11/A/21FM - October 14, 2021 - NOF ANTANANARIVO (ASECNA) - Air traffic services procedures developed for ASECNA support to air users during COVID-19 pandemic
- AIC NR 31/A/21FC - October 13, 2021 - CONGO - CORONAVIRUS PANDEMIC
- AIC NR 10/A/21FM - October 11, 2021 - FMMM - NOF ANTANANARIVO (ASECNA) - Schedule for 2022 AIRAC publications
- VALID NOTAM - GOOO - October 08, 2021 - GOOO - DAKAR NOF - Checklist of valid NOTAM
- AIC NR 30/A/21FC - October 08, 2021 - BRAZZAVILLE NOF (ASECNA) - Air traffic services procedures developed for ASECNA support to air users during COVID-19 pandemic
- SUP NR 96/A/21GO - October 08, 2021 - DXNG - NIAMTOUGOU (TOGO) - PAPI resumed normal operation
- SUP NR 63/A/21FC - October 08, 2021 - FCPP - POINTE-NOIRE (CONGO - Operating status of approach lighting system
- SUP NR 62/A/21FC - October 08, 2021 - FCPP - POINTE-NOIRE (CONGO - Operating status of runway lighting
- SUP NR 61/A/21FC - October 08, 2021 - FCBB - BRAZZAVILLE (CONGO) - Update of aeronautical information

- VALID NOTAM - FMMM - October 07, 2021 - FMMM - ANTANANARIVO NOF - Checklist of valid NOTAM
- SUP AIRAC NR 95/A/21GO - October 07, 2021 - UG853 - Changes on route
- SUP AIRAC NR 94/A/21GO - October 07, 2021 - DRRN - NIAMEY (NIGER) - Update of aerodrome charts
- SUP NR 60/A/21FC - October 07, 2021 - FKYS - YAOUNDE NSIMALEN (CAMEROON) - Update of aeronautical information
- SUP AIRAC NR 59/A/21FC - October 07, 2021 - FKKN - NGAOUNDERE (CAMEROON) - Definitive withrawn of NDB '' TJN''
- SUP AIRAC NR 58/A/21FC - October 07, 2021 - FKKN - NGAOUNDERE (CAMEROON) - Definitive withrawn of VOR '' TJN''
- SUP NR 57/A/21FC - October 06, 2021 -FCBB - BRAZZAVILLE (CONGO) - Permanent opening of taxiway D
- SUP NR 56/A/21FC - October 06, 2021 -FCBB - BRAZZAVILLE (CONGO) - Permanent closure of the sections of taxiway T
- VALID NOTAM - FCCC - October 04, 2021 - FCCC - BRAZZAVILLE NOF - Checklist of valid NOTAM

Notam

Consultation NOTAM (asecna.aero)

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French regulations

JORF

joe_20211030_0254_0055 - Arrêté du 27 octobre 2021 portant modification de l'arrêté du 13 octobre 2020 relatif aux demandes d'agrément de prestataire de services d'assistance en escale sur les aérodromes

joe_20211028_0252_0046 - Arrêté du 7 septembre 2021 modifiant l'arrêté du 7 juillet 2016 relatif à l'exploitation de services de transport aérien par la société French bee

joe_20211021_0246_0041 - Arrêté du 14 octobre 2021 modifiant l'arrêté du 9 juillet 2007 relatif à l'exploitation de services de transport aérien par la société Transavia France

joe_20211021_0246_0040 - Arrêté du 14 octobre 2021 modifiant l'arrêté du 2 novembre 2011 relatif à l'exploitation de services de transport aérien par la société ASL Airlines France SA

joe_20211014_0240_0035 - Arrêté du 8 octobre 2021 portant création de la voie aérienne Y 95 en France métropolitaine

joe_20211010_0237_0041 - Arrêté du 6 octobre 2021 portant création de la voie aérienne T 501 en France métropolitaine

joe_20211010_0237_0040 - Arrêté du 6 octobre 2021 portant création de la voie aérienne T 499 en France métropolitaine

joe_20211010_0237_0039 - Arrêté du 6 octobre 2021 portant création de la voie aérienne T 498 en France métropolitaine

joe_20211010_0237_0038 - Arrêté du 6 octobre 2021 portant création de la voie aérienne T 497 en France métropolitaine

joe_20211010_0237_0037 - Arrêté du 6 octobre 2021 portant création de la voie aérienne T 496 en France métropolitaine

joe_20211010_0237_0036 - Arrêté du 6 octobre 2021 portant création de la voie aérienne T 493 en France métropolitaine

joe_20211010_0237_0035 - Arrêté du 28 septembre 2021 modifiant l'arrêté du 22 février 2017 désignant COHOR comme coordonnateur ou facilitateur d'horaires sur certains aérodromes

joe_20211010_0237_0034 - Arrêté du 28 septembre 2021 qualifiant d'aéroport coordonné l'aéroport de Figari-Sud-Corse à certaines périodes de l'année

joe_20211008_0235_0048 - Arrêté du 5 octobre 2021 portant suppression d'une régie de recettes auprès de la direction de la sécurité de l'aviation civile Sud (budget annexe)

joe_20211008_0235_0047 - Arrêté du 28 septembre 2021 portant restriction d'exploitation de l'aérodrome de Nantes-Atlantique (Loire-Atlantique)

joe_20211002_0230_0030 - Arrêté du 28 septembre 2021 portant modification de l'arrêté du 25 juin 2019 portant limitation à l'accès au marché de l'assistance en escale pour l'aéroport de Nice-Côte d'Azur

joe_20211002_0230_0029 - Arrêté du 27 septembre 2021 modifiant l'arrêté du 19 octobre 1999 modifié qualifiant d'aéroports coordonnés les aéroports de Paris-Orly et Paris - Charles-de-Gaulle

joe_20211002_0230_0028 - Arrêté du 24 septembre 2021 modifiant l'arrêté du 29 septembre 2011 relatif à l'exploitation de services de transport aérien par la société Air Calédonie International

OSAC-DSAC

Flash Réglementaire N°7 - Exigence pesée - Ind C

Flash_reglementaire_N_15_Fin de transition MG et MF_VF

Bulletin officiel de la DGAC

Bulletin Officiel des Ministères de la Transition écologique et solidaire et de la Cohésion des territoires et des Relations avec les collectivités territoriales (developpement-durable.gouv.fr)

TRAA2130642S - DÉCISION DSNA/D N° 210118 EN DATE DU 4 OCTOBRE 2021 RELATIVE À LA MISE EN ŒUVRE DES RÉSERVES OPÉRATIONNELLES DANS LES ORGANISMES DE CONTRÔLE DE LA NAVIGATION AÉRIENNE.

TREA2126335X - CONVENTION EN DATE DU 11 OCTOBRE 2021 RELATIVE À LA DÉLÉGATION DE GESTION ENTRE LE SECRÉTARIAT GÉNÉRAL DE LA DIRECTION GÉNÉRALE DE L'AVIATION CIVILE ET LA DIRECTION DE LA SÉCURITÉ DE L'AVIATION CIVILE.

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European Centre for Cybersecurity in Aviation (ECCSA)

See : https://www.easa.europa.eu/eccsa

see link directly

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U.A.S. – Drones

See : https://www.easa.europa.eu/eccsa

Drones – A Key Piece in Fighting Wildfires

Drones and their use for fighting wildfires is a "hot" topic, with more than 6 million acres of forest burned this year.

The use of drones for fighting wildfires is a "hot" topic, with more than 6 million acres of forest burned this year. When they are used by emergency responders they have proven to help suppress and contain massive blazes, and save lives on the ground and in the air.

Drones have revolutionized wildland firefighting, and can come equipped with infrared cameras and ignition payloads for wildfire control. The FAA works with federal and state agencies to find ways to support firefighting efforts, including approving hundreds of emergency airspace authorizations to fly drones.

Tune in as we discuss various drone initiatives and programs, and their role in redefining aviation operations for wildfires. You'll hear from Mike Sheldon, an air traffic security expert for the FAA, Dirk Giles, the Forest Service's drone program manager, and Pete York, a CAL FIRE captain.

Listen to the episode on FAA.gov, Apple Podcasts, Stitcher, or Google Podcasts

Maritime Surveillance UAV Adds New SAR Capability

Under a new contract from the European Maritime Safety Agency (EMSA), CLS and TEKEVER have added a new device to the maritime patrol version of their Remotely Piloted Aircraft (RPA), the ability to deploy rescue boats for up to 8 people.

Through a four-year contract with maximum budget of €30 million, EMSA is replacing a previous contract signed in 2018 for Beyond Visual Line Of Sight (BVLOS) flights, by adding this new rescue capability for unmanned surveillance of European waters.

Deploying a boat of this size by Unmanned Aerial Vehicle (UAV) is a first in Europe. The device features Artificial Intelligence (AI) that calculates the best time to release the lifeboat to get as close as possible to the ship or person in distress. This new capability has been fully demonstrated during search and rescue exercises, with the aircraft's onboard sensors allowing the detection of survivors as the starting point for calculating the best drop point without any human intervention. The onboard AI allows the deployment of the liferaft at a distance close enough and certain enough to optimize the chances of rescue.

EMSA is facilitating increased collaboration between European countries by enabling the deployment of regional operations and in doing so enhancing the effectiveness of surveillance over European waters.

The collaboration between the CLS-TEKEVER consortium (named REACT) and EMSA has been completing drone operations since 2018, totaling 1200 flight hours on the counter and nearly 250 missions over the 4 years.

During these flights, UAVs were used for maritime surveillance and safety in European waters, environmental protection (detection of oil pollution, potential identification of polluters, and support for the fight against illegal dumping), fisheries control, and general maritime law enforcement.

"CLS has helped save more than 50,000 lives in over 30 years of activity through our contract to operate the French COSPAS- SARSAT Mission Control Center. This experience has led us to propose to EMSA a support to the rescue missions of the coast guards of the Member States," said Nadia Maaref, Director of Maritime Security at CLS.

"Since 2017, we have been using our RPA in missions commissioned by many European actors. When it comes to fighting illegal fishing, trafficking or pollution, RPAS are an essential complementary tool to the satellite services we provide to maritime authorities. With this new capability, our UAVs complete the arsenal of safety at sea that we offer. We are very proud to serve a European body like EMSA, which is at the cutting edge of technology. This renewed trust is a guarantee of the state-of-the-art of our solutions and of the reliability of our operations. "

"We've consistently and successfully tested the TEKEVER AR5's new Lifesaver capability, by deploying life rafts with very high precision in a fully automated process," added Ricardo Mendes, TEKEVER's CEO.

"This new capability, that will already be available in upcoming contracts, allows us to provide a first response in emergency situations. For the first time, and beyond detecting people in distress, we can now immediately do something to help them. This directly supports our mission of making the sea safer."

NAT OPS Bulletin

NAT OPS Bulletins - All Documents (icao.int)

NAT OPS Bulletin Checklist Issued: 05 October 2021

2020_002 Surveillance Service in the NAT / Flight Crew Operating Procedures 08 July 2020

2020_001 ACARS Data Link Oceanic Clearance Flight 06 April 2020

2019_003 Data Link performance improvement options- Revision 3 30 June 2021

2019_001 Operations Without an Assigned Fixed Speed in the NAT (OWAFS) Special Emphasis Items (SEI) 09 July 2019

2018_004 Implementation of Performance Based Separation Minima-Expanded Publication of PBCS OTS 28 March 2019

2018_003 Waypoint Insertion / Verification Special Emphasis Items – Revision 1 23 February 2021

2017_005 Revised Sample Oceanic Checklists - Revision 01 05 October 2021

2017_004 NAT Data Link Special Emphasis Items – Revision 1 23 February 2021

2017_002 Oceanic Errors - Revision 04 05 October 2021

IOSA

IATA - IOSA

Related documents can also be found here:

- IOSA Guidance for Safety Monitoring under COVID-19 Ed. 5 (pdf)
- IPM Ed 12 – Temporary Appendix - Revision 2 (pdf)
- IAH P&G Ed 11 - Temporary Appendix Revision 1(pdf)
- IOSA Operator Alert 18 - IPM IAH updates (pdf)

Safety Alerts

Date Posted	Affected Product(s)	Effective Date	Subject and Additional Information
October 7, 2021	**U.S. Terminal Procedures Publications and Digital-Terminal Procedures Publications**	October 7, 2021	Add ICAO airport code to all non-military Minimums outside the continental United States. See the 21-02 TERM Charting Notice (PDF) for complete information.
October 6, 2021	**Aeronautical Data Delivery Service (ADDS)**	October 7, 2021	Data missing from the Designated Points and ATS Routes datasets. See the 21-01 ADDS Safety Alert (PDF) for complete information.

Date Posted	Affected Product(s)	Effective Date	Subject and Additional Information
October 29, 2021	**Aeronautical Data Delivery Service (ADDS)**	December 2, 2021	Addition of SSV Field to NavaidComponent Features. See the 21-02 ADDS Charting Notice (PDF) for complete information.
October 19, 2021	**NASR 28 Day Subscription**	October 7, 2021	APT.txt contains threshold elevation error for KHRF RWY35. See the revised 21-17A NASR Safety Alert (PDF) for complete information.
October 13, 2021	**Seattle-Portland TAC Print**	October 7, 2021	Initial prints of the Seattle/Portland VFR Terminal Area Chart (TAC) are

Date Posted	Affected Product(s)	Effective Date	Subject and Additional Information
			incomplete. See the 21-04 VIS Charting Notice (PDF) for complete information.
October 8, 2021	**NASR 28 Day Subscription**	October 7, 2021	FRQ.csv designed as a comprehensive frequency data file. See the 21-03 AIS Charting Notice (PDF) for complete information.
October 6, 2021	**Aeronautical Data Delivery Service (ADDS)**	October 7, 2021	Data missing from the Designated Points and ATS Routes datasets. See the 21-01 ADDS Safety Alert (PDF) for complete information.
October 6, 2021	**Aeronautical Data Delivery Service (ADDS)**	October 7, 2021	Data missing from the Designated Points and ATS Routes datasets. See the 21-01 ADDS Safety Alert (PDF) for complete information.

Safety information bulletin

FAA

All Information for Operators (InFOs) (faa.gov)

All Safety Alerts for Operators (SAFOs) (faa.gov)

https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/MainFrame?OpenFrameSet

27/10/2021	*SAFO21006*	*BOEING* *757* *767*	*Boeing Model 757 and 767 Airplane Inadvertent Pilot Activation of Go-Around Mode*

EASA

EASA Safety Publications Tool (europa.eu)

19/10/2021	2020-01R1	Carbon Monoxide (CO) Risk in Small Aeroplanes and Helicopters
27/10/2021	SAFO21006	Boeing Model 757 and 767 Airplane Inadvertent Pilot Activation of Go-Around Mode

Cabinet d'Expertise en Aéronautique - Inscrit près la cour d'appel d'Amiens – Indépendant de l'EASA
15, le souguehain – Sénécourt – 60140 BAILLEVAL - tél : +33 (0)6 13 66 05 99 - mail : *philippe.julienne.aeroprojet@live.fr*

Conflict zone information bulletin

Conflict Zone Information Bulletin (CZIB's) | EASA (europa.eu)

30/10/2021	CZIB-2020-01R2	Airspace of Iran
30/10/2021	CZIB-2017-09R8	Airspace of Egypt Sinai Peninsula
30/10/2021	CZIB-2018-02R9	Airspace of Pakistan – Karachi and Lahore Flight Information Regions
30/10/2021	CZIB-2017-07R9	Airspace of Yemen – Sana'a Flight Information Region
30/10/2021	CZIB-2017-03R9	Airspace of Syria
30/10/2021	CZIB-2017-04R9	Airspace of Iraq
30/10/2021	CZIB-2017-08R8	Airspace of Afghanistan
30/10/2021	CZIB-2018-03R7	Airspace of South Sudan
30/10/2021	CZIB-2017-01R10	Airspace of Mali within Niamey Flight Information Region
30/10/2021	CZIB-2018-01R8	Airspace of Saudi Arabia – Jeddah Flight Information Region
30/10/2021	CZIB-2017-02R9	Airspace of Libya

FAA Update

United States

- Basic Flight Information and Air Traffic Control Procedures
- FDC 0/9801 Special Security Instructions for Transponder OPS of Civil Acft Operating Into or Out Of the United States, Into, Wi, or Across the United States Contiguous Air Defense Identification Zone (PDF)

Afghanistan

- KICZ NOTAM A0029/21 – Security – United States of America Prohibition Against Certain Flights in the Kabul Flight Information Region (OAKX) (PDF)
- FAA Background Information Regarding U.S. Civil Aviation – Afghanistan (PDF)
- Travel Warning

Bahamas

- Travel Warning
- Communication Procedures for Aircraft Operations Within the Nassau and Grand Bahamas Terminal Control Areas — International NOTAMs

Belarus

- KICZ NOTAM A0017/21 — Security — United States of America Advisory for Belarus (PDF)

Burma

- Department of Treasury Office of Foreign Assets Control (OFAC) Rules 31 CFR 537

Canada

- 14 CFR 91.707 Flights between Canada and the United States

China (PRC)

- Federal Aviation Administration (FAA) Flight Routing Authorization Requirements in United States Territorial Airspace (PDF)

Cuba

- **Cuba-Related Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- Department of Transportation Notice — Suspension of all public charter operators between any point in the United States and any point in Cuba, except José Martí International Airport (HAV) in Havana (PDF)
- OFAC information on the President's December 17, 2014 Announcement on United States Policy Changes with Respect to Cuba
- Federal Aviation Administration (FAA) Flight Routing Authorization Requirements in United States Territorial Airspace (PDF)
- 14 CFR 91.709 (PDF) and 91.713 (PDF) Operations to Cuba and Operation of Civil Aircraft of Cuban Registry
    - **Note:** While 14 CFR 91.709 remains published, there is obsolete information regarding Cuba procedures. Therefore, refer to 19 CFR 122, Subpart O — Flights to and From Cuba, for specific requirements.
- Department of Treasury Office of Foreign Assets Control (OFAC) Rules 31 CFR 515/596
- Department of Commerce Export Administration Regulations Database —
    - Especially note license restrictions listed in 15 CFR 740.15 Aircraft and Vessels (AVS)

Egypt

- KICZ NOTAM A0010/21 — Security — United States of America Advisory for Egypt Sinai (PDF)
- FAA Background Information Regarding U.S. Civil Aviation — Egypt Sinai Peninsula (PDF)
- Travel Alert

Eritrea

- Travel Warning

Ethiopia

- Travel Warning

Iran

- Special Federal Aviation Regulation (SFAR) 117 — Prohibition Against Certain Flights in the Tehran Flight Information Region (FIR) (OIIX)
- KICZ NOTAM A0050/20 — Security — Iran Pointer NOTAM (PDF)
- Travel Warning
- Federal Aviation Administration (FAA) Flight Routing Authorization Requirements in United States Territorial Airspace (PDF)
- Department of Treasury Office of Foreign Assets Control (OFAC) Rules 31 CFR 560/596
- Department of Commerce Export Administration Regulations Database —
    - Especially note license restrictions listed in 15 CFR 740.15 Aircraft and Vessels (AVS)
- Department of Commerce 15 CFR 740 Aircraft and Vessels (AVS) License Exception Not Available

Iraq

- Special Federal Aviation Regulation (SFAR) 77 — Prohibition Against Certain Flights in the Baghdad Flight Information Region (FIR) (ORBB)
- **Iraq-Related Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- Travel Warning
- Department of Treasury Office of Foreign Assets Control (OFAC) Rules 31 CFR 575
- Department of Treasury Office of Foreign Assets Control (OFAC) Rules 31 CFR 576: Iraq Stabilization and Insurgency Sanctions Regulations
- OFAC Removal of Iraqi Sanctions in 31 CFR Part 575

Israel, West Bank, and Gaza

- Travel Warning
- United States Embassy Messages for U.S. Citizens

Kenya

- KICZ NOTAM A0005/21 — Security — United States of America Advisory for Kenya (PDF)

- FAA Background Information Regarding U.S. Civil Aviation in the Territory and Airspace of Kenya (PDF)
- Travel Warning

Korea, North

- **North Korea Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- Special Federal Aviation Regulation (SFAR) 79 — Prohibition Against Certain Flights in the Pyongyang Flight Information Region (FIR) (ZKKP)
- KICZ NOTAM A0045/20 — Security — North Korea Pointer NOTAM (PDF)
- Travel Warning
- Federal Aviation Administration (FAA) Flight Routing Authorization Requirements in United States Territorial Airspace (PDF)
- Department of Treasury Office of Foreign Assets Control (OFAC) Rules 31 CFR 510

Libya

- **Libya Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- Special Federal Aviation Regulation (SFAR) 112 — Prohibition Against Certain Flights in the Tripoli Flight Information Region (FIR) (HLLL)
- KICZ NOTAM A0042/20 — Security — Libya Pointer NOTAM (PDF)
- ICAO Letter on the Safety of Civil Aircraft in Tripoli (HLLL) Flight Information Region (PDF)
- Travel Warning

Mali

- **Mali-Related Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- KICZ NOTAM A0003/21 — Security — United States of America Advisory for Mali (PDF)
- FAA Background Information Regarding U.S. Civil Aviation in the Territory and Airspace of Mali (PDF)
- Travel Warning

Pakistan

- KICZ NOTAM A0001/21 — Security — United States of America Advisory for Pakistan (PDF)
- FAA Background Information Regarding U.S. Civil Aviation — Pakistan (PDF)
- Travel Warning

Persian Gulf and Gulf of Oman

- KICZ NOTAM A0016/20 — Security — United States of America Advisory for Overwater Airspace Above the Persian Gulf and the Gulf of Oman (PDF)
- FAA Background Information Regarding U.S. Civil Aviation-Overwater Airspace Above the Persian Gulf and Gulf of Oman (PDF)

Russian Federation

- **Russian Harmful Foreign Activities Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- KICZ NOTAM A0012/21 — Security — United States of America Advisory for Russia (PDF)
- FAA Background Information Regarding U.S. Civil Aviation — Russia (PDF)
- Travel Alert
- Federal Aviation Administration (FAA) Flight Routing Authorization Requirements in United States Territorial Airspace (PDF)
- Special Notice: Provideniya Bay Airport (PDF)
- Russian Airspace Reorganization (PDF)

Somalia

- Special Federal Aviation Regulation (SFAR) 107 — Prohibition Against Certain Flights in the Territory and Airspace of Somalia
- KICZ NOTAM A0028/19 — Security — Somalia Pointer NOTAM (PDF)
- Travel Warning

Sudan

- **Sudan and Darfur Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- **South Sudan-Related Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- Travel Warning
- Federal Aviation Administration (FAA) Flight Routing Authorization Requirements in United States Territorial Airspace (PDF)

Syria

- **Syria Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- **Syria and Syria-Related Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- Special Federal Aviation Regulation (SFAR) 114 — Prohibition Against Certain Flights in the Damascus Flight Information Region (FIR) (OSTT)
- KICZ NOTAM A0053/20 — Security — Damascus Pointer NOTAM (PDF)

- KICZ NOTAM A0009/18 — Security — United States of America Advisory for Airspace Immediately Adjacent to Damascus Flight Information Region (OSTT FIR) (PDF)
- FAA Background Information Regarding U.S. Civil Aviation — Airspace Immediately Adjacent to the Damascus Flight Information Region (PDF)
- Travel Warning
- Federal Aviation Administration (FAA) Flight Routing Authorization Requirements in United States Territorial Airspace (PDF)
- 22 March 2013 ICAO Letter Concerning Safety of Civil Aircraft Operating in Damascus FIR (PDF)
- Department of Treasury Office of Foreign Assets Control (OFAC) Rules 31 CFR 542 / 596
- Department of Commerce 15 CFR 740 Aircraft and Vessels (AVS) License Exception
- Department of Transportation (DOT) Order 86-12-48 (PDF)
- Executive Order 13582 (PDF)

Ukraine

- **Ukraine-/Russia-Related Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- Special Federal Aviation Regulation (SFAR) 113 – Prohibition Against Certain Flights in Specified Areas of the Dnipropetrovsk Flight Information Region (FIR) (UKDV) (PDF)
- KICZ NOTAM A0030/21 – Security – Ukraine Pointer NOTAM (PDF)
- Travel Warning

Venezuela

- **Venezuela-Related Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- KICZ NOTAM A0013/19 — Security — United States of America Prohibition for Venezuela (PDF)
- FAA Background Information Regarding U.S. Civil Aviation in the Territory and Airspace of Venezuela (PDF)
- DOT Suspension of Air Service to and from Venezuela (PDF)

Yemen

- **Yemen-Related Sanctions:** Department of Treasury Office of Foreign Assets Control (OFAC)
- Special Federal Aviation Regulation (SFAR) 115 — Prohibition Against Certain Flights in Specified Areas of the Sanaa (OYSC) Flight Information Region (FIR)
- KICZ NOTAM A0030/19 — Security — Yemen Pointer NOTAM (PDF)
- Travel Warning

Certification Up date

FAA do not need to be followed in this part? due to ECFR – See part Regulation or safety Bulletins for completion.

Document Title:	Boeing 767
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only
Document Title:	**Dassault Aviation, Falcon 7X/8X**
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only
Document Title:	**Gulfstream Aerospace GVI (G650), GVI (G650ER)**
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only

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Document Title:	Embraer, EMB-545, EMB-550
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only
Document Title:	**Pilatus Aircraft Ltd., PC-24**
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only
Document Title:	**Airbus SAS, A330-200 Series, A330-200 Freighter Series, A330-300 Series, A330-800 Series, A330-900 Series, All Models**
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only
Document Title:	**Cirrus Design Corporation, Vision SF50**
Document for Download:	Final Comment Log (PDF)

Document Title:	Cirrus Design Corporation, Vision SF50
Comments:	**Not Required. This report is being made available for information purposes only**
Document Title:	**Lockheed Martin Corporation, P-3**
Document for Download:	Final Comment Log (PDF)
Comments:	**Not Required. This report is being made available for information purposes only**

EASA

- Proposed Certification Memorandum CM 21.A-A-002 Parts Detached from Rotorcraft - Issue 1
- Operationalisation of the Single African Air Transport Market (SAATM) – Support to the African Civil Aviation Commission (AFCAC)
- Final SC ref. SC-C25.561-01 Issue 02 on "Cabin Attendant Seat mounted on movable interior monument"

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Master MEL-OSD

MMEL

Document Title:	Gulfstream Aerospace GVI (G650), GVI (G650ER)
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only
Document Title:	Embraer, EMB-545, EMB-550
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only
Document Title:	Pilatus Aircraft Ltd., PC-24
Document for Download:	Final Comment Log (PDF)
Comments:	Not Required. This report is being made available for information purposes only

Document Title:	**Airbus SAS, A330-200 Series, A330-200 Freighter Series, A330-300 Series, A330-800 Series, A330-900 Series, All Models**
Document for Download:	Final Comment Log (PDF)
Comments:	**Not Required. This report is being made available for information purposes only**
Document Title:	**Cirrus Design Corporation, Vision SF50**
Document for Download:	Final Comment Log (PDF)
Comments:	**Not Required. This report is being made available for information purposes only**
Document Title:	**Lockheed Martin Corporation, P-3**
Document for Download:	Final Comment Log (PDF)
Comments:	**Not Required. This report is being made available for information purposes only**
Document Title:	**328 Support Services GmbH, Dornier Model 328-300**
Document for Download:	Final Comment Log (PDF)

Cabinet d'Expertise en Aéronautique - Inscrit près la cour d'appel d'Amiens – Indépendant de l'EASA
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Document Title:	328 Support Services GmbH, Dornier Model 328-300
Comments:	**Not Required. This report is being made available for information purposes only**
Document Title:	**Tandem Rotor, LLC, CH-47D, (R0014DE)**
Document for Download:	Final Comment Log (PDF)
Comments:	**Not Required. This report is being made available for information purposes only**

Document Title:	MMEL R-66 Rev 1, Robinson Helicopter Company, R66 (TCDS R00015LA)
Summary:	Outlines the Master Minimum Equipment requirements and procedures for Robinson Helicopter Company rotorcraft model R66 (TCDS R00015LA). Provides lists/tables and resources for use by inspectors, pilots, technicians, and others in the field and public sector.
Documents for Download:	Draft Document (PDF) Draft Document Comment Grid (MS Word)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 91, General Operating and Flight Rules • Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations • Part 125, Certification and Operations: Airplanes Having A Seating Capacity of 20 or More Passengers or A Maximum Payload Capacity

Document Title:	MMEL R-66 Rev 1, Robinson Helicopter Company, R66 (TCDS R00015LA)
	of 6,000 Pounds or More; and Rules Governing Persons On Board Such Aircraft • Part 129, Operations: Foreign Air Carriers and Foreign Operators of U.S.-Registered Aircraft Engaged In Common Carriage • Part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft. MMEL Policy Letter PL-25, MMEL and MEL Definitions MMEL Policy Letter PL-34, MMEL and MEL Preamble MMEL Policy Letter PL-36, 14 CFR Part 91 MEL Approval and Preamble
Comments Due:	November 1, 2021
How to Comment:	**Email comments to:** Email Comments

Document Title:	MMEL R-66 Rev 1, Robinson Helicopter Company, R66 (TCDS R00015LA)
Summary:	Outlines the Master Minimum Equipment requirements and procedures for Robinson Helicopter Company rotorcraft model R66 (TCDS R00015LA). Provides lists/tables and resources for use by inspectors, pilots, technicians, and others in the field and public sector.
Documents for Download:	Draft Document (PDF) Draft Document Comment Grid (MS Word)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 91, General Operating and Flight Rules • Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations • Part 125, Certification and Operations: Airplanes Having A Seating Capacity of 20 or More Passengers or A Maximum Payload Capacity of 6,000 Pounds or More; and Rules Governing Persons On Board Such Aircraft

Document Title:	**MMEL R-66 Rev 1, Robinson Helicopter Company, R66 (TCDS R00015LA)**
	• Part 129, Operations: Foreign Air Carriers and Foreign Operators of U.S.-Registered Aircraft Engaged In Common Carriage • Part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft. MMEL Policy Letter PL-25, MMEL and MEL Definitions MMEL Policy Letter PL-34, MMEL and MEL Preamble MMEL Policy Letter PL-36, 14 CFR Part 91 MEL Approval and Preamble
Comments Due:	November 1, 2021
How to Comment:	**Email comments to:** Email Comments
Document Title:	**MMEL B737 MAX Rev 4, Boeing 737 MAX, B-737-7/-8/-8200/-9**
Summary:	The purpose of this Master Minimum Equipment List (MMEL) revision (Rev 4) is to add/identify the Boeing B-737-7 to/as part of the Boeing 737 MAX B-737-8/-8200/-9 MMEL.
Documents for Download:	Draft Document (PDF) Draft Document Comment Grid (MS Word)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 91, General Operating and Flight Rules • Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations • Part 125, Certification and Operations: Airplanes Having A Seating Capacity of 20 or More Passengers or A Maximum Payload Capacity of 6,000 Pounds or More; and Rules Governing Persons On Board Such Aircraft • Part 129, Operations: Foreign Air Carriers and Foreign Operators of U.S.-Registered Aircraft Engaged In Common Carriage

Document Title:	**MMEL B737 MAX Rev 4, Boeing 737 MAX, B-737-7/-8/-8200/-9**
	• Part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft. MMEL Policy Letter PL-25, MMEL and MEL Definitions MMEL Policy Letter PL-34, MMEL and MEL Preamble MMEL Policy Letter PL-36, 14 CFR Part 91 MEL Approval and Preamble
Comments Due:	November 2, 2021
How to Comment:	**Email comments to:** Email Comments
Document Title:	**MMEL GVII-G500/G600 Rev 3, Gulfstream Aerospace, GVII-G500/G600**
Summary:	Outlines the Master Minimum Equipment requirements and procedures for Gulfstream Aerospace aircraft models GVII G500 and GVII G600. Provides lists/tables and resources for use by inspectors, pilots, technicians, and others in the field and public sector.
Documents for Download:	Draft Document (PDF) Draft Document Comment Grid (MS Word)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 91, General Operating and Flight Rules • Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations • Part 125, Certification and Operations: Airplanes Having A Seating Capacity of 20 or More Passengers or A Maximum Payload Capacity of 6,000 Pounds or More; and Rules Governing Persons On Board Such Aircraft • Part 129, Operations: Foreign Air Carriers and Foreign Operators of U.S.-Registered Aircraft Engaged In Common Carriage

Document Title:	MMEL GVII-G500/G600 Rev 3, Gulfstream Aerospace, GVII-G500/G600
	• Part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft. MMEL Policy Letter PL-25, MMEL and MEL Definitions MMEL Policy Letter PL-34, MMEL and MEL Preamble MMEL Policy Letter PL-36, 14 CFR Part 91 MEL Approval and Preamble
Comments Due:	November 29, 2021
How to Comment:	**Email comments to:** Email Comments

Document Title:	MMEL BH-212/412 Rev 10, Bell Textron Inc., 212, 412, 412CF, 412EP (H4SW)
Summary:	Outlines the Master Minimum Equipment requirements and procedures for Bell Textron Inc. rotorcraft models 212, 412, 412CF, and 412EP. Provides lists/tables and resources for use by inspectors, pilots, technicians, and others in the field and public sector.
Documents for Download:	Draft Document (PDF) Draft Document Comment Grid (MS Word)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 91, General Operating and Flight Rules • Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations • Part 125, Certification and Operations: Airplanes Having A Seating Capacity of 20 or More Passengers or A Maximum Payload Capacity

Document Title:	MMEL BH-212/412 Rev 10, Bell Textron Inc., 212, 412, 412CF, 412EP (H4SW)
	of 6,000 Pounds or More; and Rules Governing Persons On Board Such Aircraft • Part 129, Operations: Foreign Air Carriers and Foreign Operators of U.S.-Registered Aircraft Engaged In Common Carriage • Part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft. MMEL Policy Letter PL-25, MMEL and MEL Definitions MMEL Policy Letter PL-34, MMEL and MEL Preamble MMEL Policy Letter PL-36, FAR Part 91 MEL Approval & Preamble
Comments Due:	October 7, 2021
How to Comment:	**Deliver comments by mail or hand to:** Colin A. Cook 600 Maryland Ave SW Suite 610E Washington, DC 20024 **Email comments to:** Email Comments
Document Title:	**MMEL G-IV Rev 12, Gulfstream Aerospace, GIV, (G300), (G400)**
Summary:	This Master Minimum Equipment List (MMEL) outlines the requirements and procedures for the Gulfstream Aerospace Corporation (GAC) G IV (G 300) (G 400) series aircraft. This MMEL provides lists/tables and resources for use by inspectors, pilots, technicians, in the field and the public sector.
Documents for Download:	Draft Document (PDF) Draft Document Comment Grid (MS Word)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 91, General Operating and Flight Rules

Document Title:	MMEL G-IV Rev 12, Gulfstream Aerospace, GIV, (G300), (G400)
	• Part 125, Certification and Operations: Airplanes Having A Seating Capacity of 20 or More Passengers or A Maximum Payload Capacity of 6,000 Pounds or More; and Rules Governing Persons On Board Such Aircraft • Part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft. MMEL Policy Letter PL-25, MMEL and MEL Definitions MMEL Policy Letter PL-34, MMEL and MEL Preamble MMEL Policy Letter PL-36, FAR Part 91 MEL Approval & Preamble MMEL Policy Letter PL-119, Two-Section MMELs (Parts 91, 125, and 135).
Comments Due:	October 18, 2021
How to Comment:	**Deliver comments by mail or hand to:** Colin A. Cook 600 Maryland Ave SW Suite 610E Washington, DC 20024 **Email comments to:** Email Comments

Document Title:	MMEL R-66 Rev 1, Robinson Helicopter Company, R66 (TCDS R00015LA)
Summary:	Outlines the Master Minimum Equipment requirements and procedures for Robinson Helicopter Company rotorcraft model R66 (TCDS R00015LA). Provides lists/tables and resources for use by inspectors, pilots, technicians, and others in the field and public sector.
Documents for Download:	Draft Document (PDF) Draft Document Comment Grid (MS Word)

Document Title:	MMEL R-66 Rev 1, Robinson Helicopter Company, R66 (TCDS R00015LA)
Reference:	***Title 14 of the Code of Federal Regulations (14 CFR)*** • Part 91, General Operating and Flight Rules • Part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations • Part 125, Certification and Operations: Airplanes Having A Seating Capacity of 20 or More Passengers or A Maximum Payload Capacity of 6,000 Pounds or More; and Rules Governing Persons On Board Such Aircraft • Part 129, Operations: Foreign Air Carriers and Foreign Operators of U.S.-Registered Aircraft Engaged In Common Carriage • Part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft. MMEL Policy Letter PL-25, MMEL and MEL Definitions MMEL Policy Letter PL-34, MMEL and MEL Preamble MMEL Policy Letter PL-36, FAR Part 91 MEL Approval & Preamble
Comments Due:	November 1, 2021
How to Comment:	**Email comments to:** Email Comments

OSD – FSBR

Operational Evaluation Guidance Material (OE GM) / Operational Evaluation Reports (OEB) / Operational Suitability Data (OSD) | EASA (europa.eu)

- Equivalent Safety Finding to CS 29.807(c) - Use of flight crew emergency exits for passenger evacuation with the rotorcraft on its side - Issue 01
- Finale ESF-FCD.425.-01 Issue 02 on "CS-FCD T3 Evaluation Process"
- Mission+ v1.0 for iPadOS – EASA EFB Evaluation Letter

SEE ATTACHED

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FAA Safety Briefing

Avoiding Adverse Drug Interactions

SEE ATTACHED

Cabinet d'Expertise en Aéronautique - Inscrit près la cour d'appel d'Amiens – Indépendant de l'EASA

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Publications

Recherche : NEWS (icao.int)

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Newsroom & Events | EASA (europa.eu)

Three Military Airports Now Eligible for Funding to Add Civilian Operations

WASHINGTON –The U.S. Department of Transportation's Federal Aviation Administration (FAA) has selected three airports to be eligible for grants to add civilian aviation operations at former and current military airfields, adding system capacity and helping to reduce congestion at existing airports. Kelly Field in San Antonio, Texas; Mobile Downtown Airport in Mobile, Ala.; and Salina Regional Airport in Salina, Kan., will now be able to apply for Airport Improvement Grants.

"Adding civilian flights to these airports increases their role in fostering economic growth and creating jobs in their communities," U.S. Transportation Secretary Pete Buttigieg said.

"Working with local stakeholders, the Military Airport Program is an innovative and fiscally responsible way to help improve prior military facilities and make them an important economic driver for their communities." FAA Associate Administrator of Airports Shannetta Griffin said.

The Military Airport Program (MAP) provides funding as a set aside of the Airport Improvement Program (AIP) to help increase civilian aviation capacity at current or former military airports by funding projects such as surface parking lots, fuel farms, hangars, utility systems, access roads, cargo buildings, and other airfield-related infrastructure.

This is the first time these three airports are participating in the program. The FAA will work with each airport to determine specific funding needs. Additional details about the three airports selected is included below:

- Kelly Field in San Antonio, Texas, a joint-use general aviation airport, will participate in the program for five years. The FAA may be able to provide funds for developing a building, parking lot, aircraft parking apron, hangar, and connector taxiways.
- Mobile Downtown Airport in Mobile, Ala., a primary non-hub airport located on the former Brookley Air Force Base, will also participate in the program for five years. The FAA may be able to provide funds for utility construction, improving airport drainage, parking lot construction, and an apron reconstruction project.
- Salina Regional Airport in Salina, Kan., a primary non-hub airport on the former Schilling Air Force Base, may receive funds to rehabilitate a fuel farm and parking lot. The airport will be in the program for four years.

With three new airports joining the program, seven airports are now eligible for MAP funding in Fiscal Year 2022. Airports already in the program are Tipton Airport in Odenton, Md.; Killeen-Fort Hood Regional Airport in Killeen, Texas; Roswell International Air Center in Roswell, N.M.; and Sawyer International Airport in Gwinn, Mich.

The MAP allows the FAA to designate up to 15 joint-use or former military airports to participate each fiscal year. Three of the 15 airports may be general aviation airports and the remaining 12 must be commercial service or reliever airports. Selected airports are designated for a period of one to five years. Previously selected airports may re-apply to the program.

The airports in this program have unique project-eligibility rules to convert them to civilian or joint use, thereby increasing the capacity of the National Airspace System to serve the flying public. Since 1991, the FAA has provided approximately $764 million to more than 35 airports through the program.

The FAA will announce the next program open-application period in late 2022.

FAA Launches Nationwide Solicitation to Design Air Traffic Control Towers of the Future

WASHINGTON – The U.S. Department of Transportation's Federal Aviation Administration (FAA) is launching a nationwide solicitation to find a new design for control towers that can be built and operated sustainably at regional and municipal airports.

"For communities large and small, the air traffic control tower is an icon. We want architects and engineers from every corner of the country to help build the safe and sustainable towers of the future," U.S. Transportation Secretary Pete Buttigieg said.

The FAA has more than 100 aging control towers at regional and municipal airports across the United States that will eventually need to be replaced. The goal of the nationwide solicitation is to develop a standardized design for towers that will:

- Meet operational and cost requirements
- Maximize energy efficiency
- Be easy to modify according to height needs
- Be rapidly constructed

On Nov. 9, the FAA will host a webinar to answer questions from interested businesses before the official solicitation starts. Between now and then, the FAA will raise awareness of the opportunity to minority-owned and disadvantaged businesses.

The registration opening for U.S.-based architectural and engineering design firms is scheduled for Nov. 16. Details about the webinar and other aspects of the solicitation are available at https://www.faa.gov/go/towerdesign.

A three-phase, best value and fixed-price selection process will be used in accordance with the Acquisition Management System (AMS).

- Phase 1 - Request for Information (RFI): Architectural and engineering firms may submit a general project idea and approach statement. Based on these submissions, the FAA will narrow the field of choices to 15 firms that will be eligible to compete in Phase 2.
- Phase 2 - Request for Qualifications (RFQ): In Phase 2, the up to 15 selected firms will be asked to provide resumes, relevant experience and financial capabilities. Based on these submissions, up to six firms will be selected to provide a conceptual design package and cost estimate for the complete tower design in Phase 3.
- Phase 3 – Request for Offer (RFO): In Phase 3, the FAA will evaluate the design package and cost estimate from each of the six firms selected from Phase 2. From those six submissions, the FAA plans to award a contract to a top-rated applicant to fully design the new air traffic control tower concept.

The FAA used a similar approach when it invited architectural firms to develop a modular design concept for new control towers. The agency ultimately selected a proposal from the company headed by rising architect I.M. Pei. Several of the 16 Pei-designed towers—including at Chicago O'Hare, Sacramento, Madison, and Jacksonville international airports—are still operating today.

The tower at Tucson International Airport provides an example of sustainable building already in operation. The tower is the first air traffic facility with net-zero energy consumption. It uses a 1,600-panel solar farm to generate power for all of its electrical needs, and supplies unused power back to the grid. The solar farm also produces ice, which is stored in large containers and used to cool the building when solar panels are not generating electricity. Additional 'green' features at Tucson include reflective roofing materials, insulated windows, motion detectors for the low-energy, indoor lights, and no-water landscaping.

The Air Transport Monthly Monitor for October 2021

The air transport industry is not only a vital engine of global socio-economic growth, but it is also of vital importance as a catalyst for economic development. Not only does the industry create direct and indirect employment and support tourism and local businesses, but it also stimulates foreign investment and international trade.

Informed decision-making is the foundation upon which successful businesses are built. In a fast-growing industry like aviation, planners and investors require the most comprehensive, up-to-date, and reliable data. ICAO's aviation data/statistics programme provides accurate, reliable and consistent aviation data so that States, international organizations, the aviation industry, tourism and other stakeholders can:

- make better projections;
- control costs and risks;
- improve business valuations; and

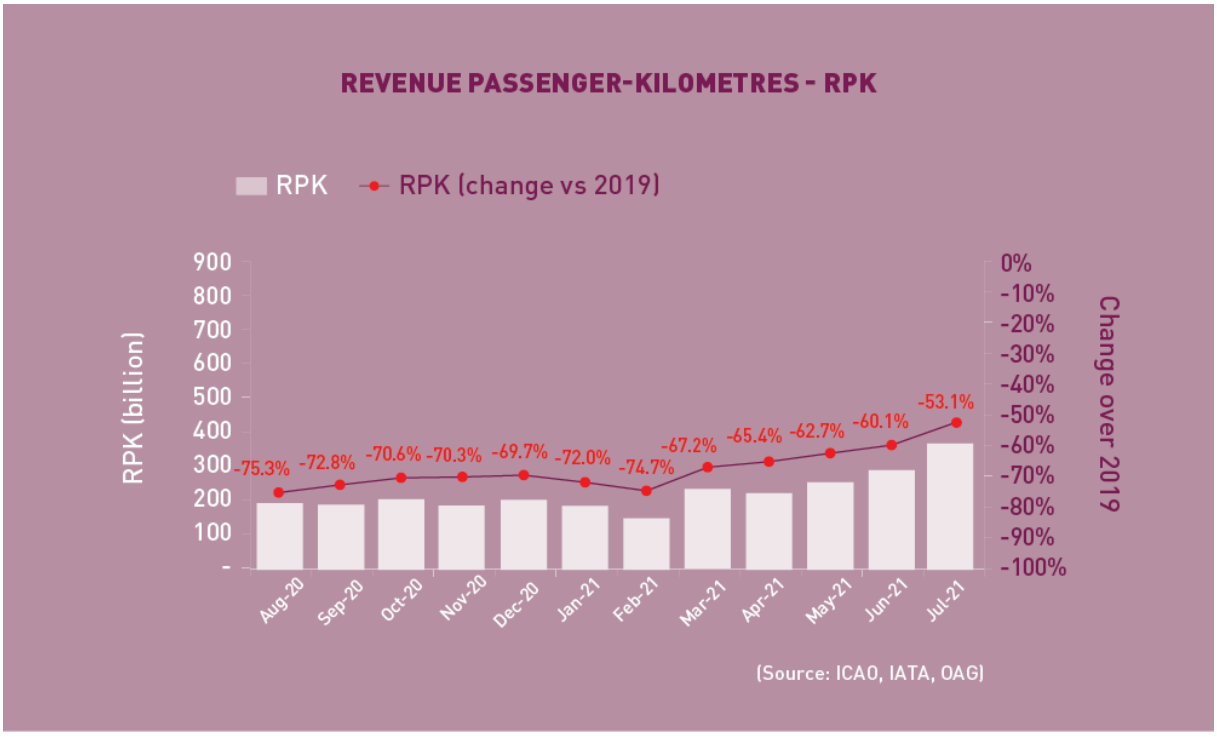
- benchmark performance.

The UN recognized ICAO as the central agency responsible for the collection, analysis, publication, standardization, improvement and dissemination of statistics pertaining to civil aviation. Because of its status as a UN specialized agency, ICAO remains independent from outside influences and is committed to consistently offering comprehensive and objective data. Every month ICAO produces this Air Transport Monitor, a monthly snapshot and analysis of the economic and aviation indicators.

ECONOMIC DEVELOPMENT – October 2021

World Results and Analyses for August 2021

Total Scheduled Services (Domestic and International)

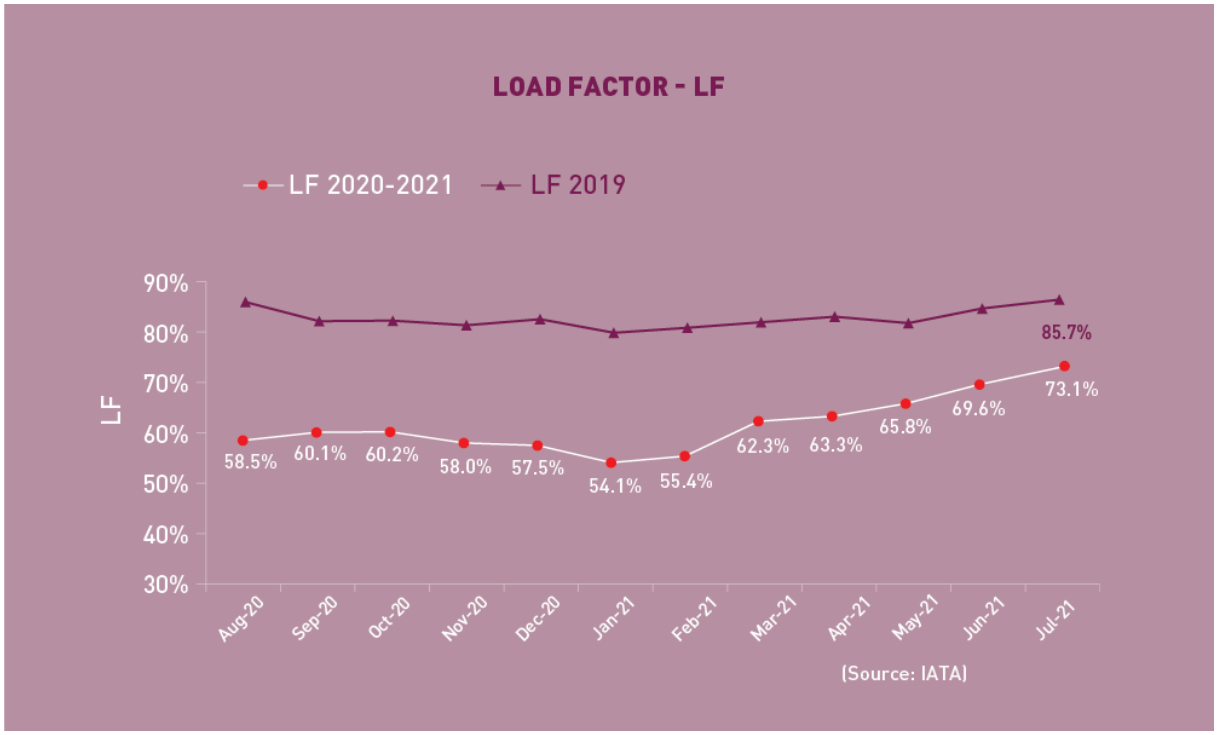


Revenue Passenger-Kilometres – RPK

World passenger traffic fell by -53.1% in July 2021 (compared to 2019), +7.0 percentage points up from the decline in the previous month. The rebound of air travel was attributed to a combination of factors such as the traditional peak northern hemisphere summer travel, pent-up holiday travel demand, and progress in vaccine rollout globally. Nevertheless, the rapid spread of new variants poses risks to reversing the recovery trend. Domestic traffic continued to lead the recovery chart, with key domestic markets returning to above or close to pre-pandemic.

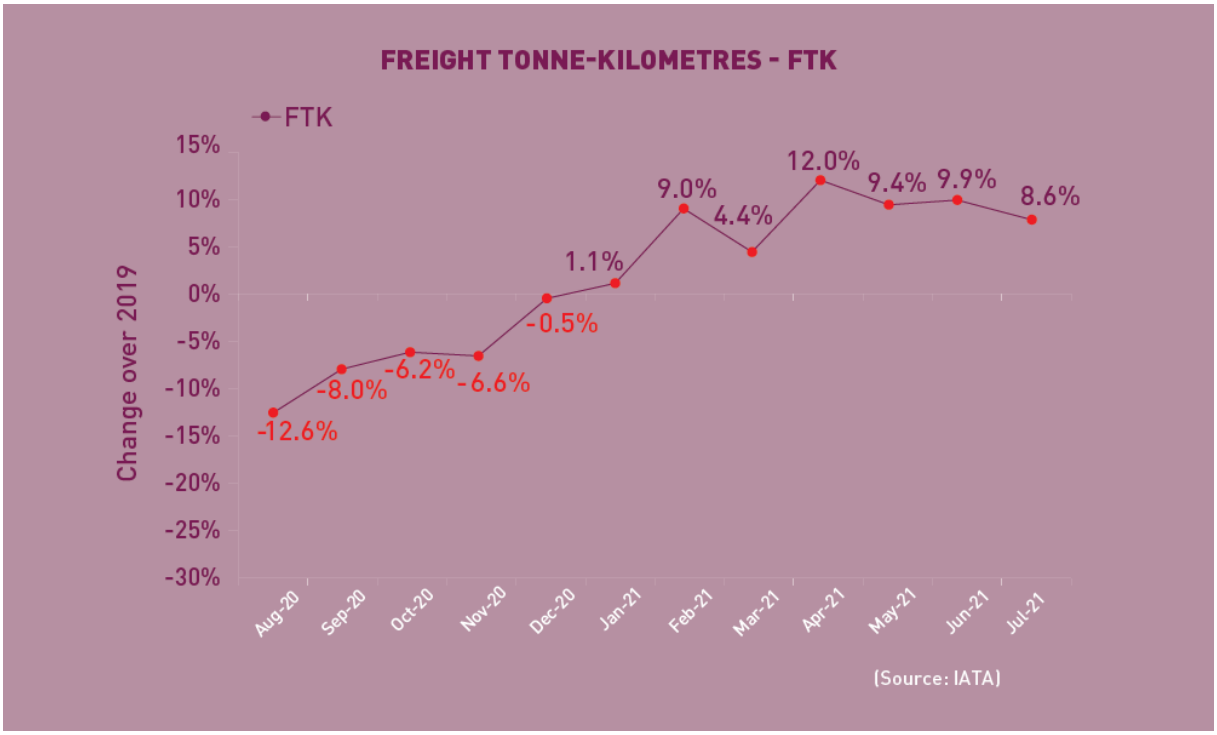
International Traffic vs. Tourist Arrivals

International passenger numbers fell by -67.8% in July 2021 (compared to 2019), +10.4 percentage points up from the decline in the previous month. International traffic rebounded across almost all key regions, particularly in Europe owing to the reopening of intra Europe travel. The international tourist arrivals also rebounded and followed a similar trend as international passenger traffic.



The passenger Load Factor reached 73.1% in July 2021, +3.5 percentage points higher than the previous month. The domestic load factor returned to the level of over 80%, outperforming the international load factor. As the recovery of capacity was faster than travel demand recovery, the July LF remained significantly below 2019 levels at -12.6 percentage points lower.

Freight Traffic



Freight Tonne-Kilometres – FTK

World freight traffic reported a growth of +8.6% in July 2021 (compared to 2019), -1.3 percentage points lower than the growth in the previous month. Despite a slight slowdown, the growth trend of air cargo remained strong broadly. The current state of supply chains and demand for businesses to restock inventories remains highly supportive to air cargo. Regional performance continued to vary from each other. North America and the Middle East posted the strongest growth double-digitally; Growth in Europe was solid although relatively moderate. For Asia/Pacific, the growth momentum started to show a sign of softening, while Latin America/Caribbean continued to be the only region posting negative growth.

New ICAO publications available on eLibrary

We are pleased to inform you that the following titles have been published on ICAO.

Sl No	Code	Title	Type	Edition	Descriptions
1	10151-5	Doc 10151 - دليل الجهات التنظيمية في مجال الأداء البشري	Safety	1	Click Here

2	978-92-9265-582-2	Doc 10152 - Manual on Testing and Cross-border Risk Management Measures	Security and Facilitation	3	Click Here
3	10151-6	Doc 10151 - 监管者人员绩效手册	Safety	1	Click Here
4	978-92-9249-967-9	Annex 10 — Aeronautical Telecommunications	Safety	7	Click Here
5	978-92-9249-997-6	Приложение 10. Авиационная электросвязь	Safety	7	Click Here
6	978-92-9249-990-7	Annexe 10 — Télécommunications aéronautiques	Safety	7	Click Here
7	978-92-9258-032-2	Anexo 10 — Telecomunicaciones aeronáuticas	Safety	7	Click Here
8	978-92-9249-994-5	الملحق العاشر — اتصالات الطيران	Safety	7	Click Here

FAA Proposes Longer Rest Period Between Shifts for Flight Attendants

WASHINGTON – The U.S. Department of Transportation's Federal Aviation Administration (FAA) today proposed a regulation to require that flight attendants have a longer rest period between shifts. The proposed rule would increase the rest period to 10 consecutive hours when scheduled for a duty period of 14 hours or less.

"The Biden-Harris Administration is proud to advance policies that protect and empower workers. This proposal will contribute to a safer, healthier workplace for flight attendants," said Transportation Secretary Pete Buttigieg.

"Flight attendants play a critical safety role in keeping passengers safe on every flight and especially in emergencies. This proposal helps reduce fatigue so they can perform this critical role," FAA Administrator Steve Dickson said.

Currently, flight attendants are required to have nine consecutive hours in their rest period. In 2018, under the FAA Reauthorization Act, Congress directed the FAA to increase the minimum rest period for flight attendants with scheduled duty of 14 hours or less in domestic, flag and supplemental flights. The Reauthorization Act also required the FAA to prohibit a reduction of the rest period under any circumstances. The FAA's proposal meets those requirements.

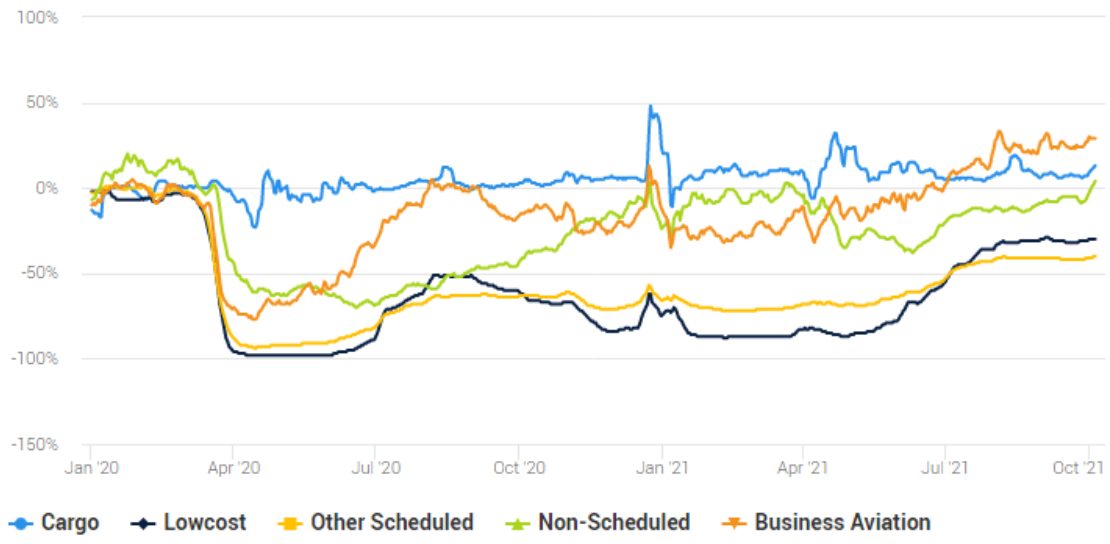
In September 2019, the FAA invited the public to submit initial comments ahead of its proposed rule released today. The FAA also conducted outreach with air carriers to which the new requirements would apply.

The public has 60 days to comment on the draft rule once is published in the Federal Register. The FAA will publish a final rule after the comment period closes.

EUROCONTROL Data Snapshot #19 on Europe's business aviation recovery from COVID-19

Business aviation in Europe is holding onto its 'best recovery from COVID-19' trophy, for now.

Our 19th EUROCONTROL Data Snapshot is here, focusing on the continued recovery of Europe's business aviation sector from the COVID-19 pandemic.



Since the start of the COVID-19 pandemic, just two segments of European aviation have managed an extended period back at 2019 levels of traffic: all-cargo and business aviation. Business aviation briefly matched 2019 volumes in summer 2020. The graph shows that this segment's recovery then restarted in April 2021, passing 2019 levels in July and stabilising at 20%-30% above 2019 since August (2,728 average daily flights in Aug-Sep compared to 2,182 in 2019). As a result, its market share has climbed from around 6% in 2019 (Jan-Sep), to 13% in 2021 so far.

Growth as strong as this comes from changes in both supply and demand: operators finding new ways to reach customers, and new services to offer, such as shared flights; plus new passengers turning to business aviation flights, because the connectivity they want isn't currently available with the timing or quality that they want.

Already this year's recovery for business aviation is more sustained than last year's. In summer, the focus of business aviation switches to Mediterranean, leisure destinations: Nice-Côte d'Azur airport often takes the top spot from Paris Le Bourget in July and August. This year was no exception to that rule, but Ibiza, Palma de Mallorca, Athens and Malaga were also all higher in the rankings than in a normal summer, with Palma, Athens and Malaga more than 40% above 2019 flights in August. So leisure has clearly contributed strongly to the growth of business aviation.

Early signs in September suggest that the growth will continue, but soften from its current 20%+ over 2019. Traffic at Olbia in Sardinia, which can be ahead of Le Bourget in the rankings in August, has declined less than normal in September, with strong growth over 2019 that still contributes to the 29% overall. Palma and Malaga are similar. So leisure continues to contribute.

However, growth at major airports away from the Mediterranean - Le Bourget, Geneva, Farnborough, Moscow, Luton – is in single figures in September, or even lower than 2019. As these increasingly make up a larger share of flights as autumn progresses, overall growth is likely to weaken. There are strong points – Zurich, Istanbul Ataturk, Berlin – which might help to sustain the current growth into the Autumn. Meanwhile, routes out of Europe crept above 2019 in July and August, boosted by flights from Moscow, but are back below 2019 in September. The expected re-opening of flights across the North Atlantic should help keep to keep business aviation in growth.

See attached

Ministers and industry leaders have convened to discuss air travel and trade recovery priorities

For two weeks the attention of ministers of transport and health for 193 countries will be focused on air transport, as discussions are underway at the ICAO High-level Conference on COVID-19 (HLCC) on how to safely accelerate the resumption of global air connections to revitalize tourism and trade.

Event interactions, taking place from 12 to 22 October, will focus not only on near-term objectives relevant to countries' traveler vaccination and related pandemic risk mitigation measures, but also on medium- and long-term resilience and sustainability objectives to assure future infectious disease events might be managed with far less global disruption. On ICAO TV we are sharing the recordings of the discussions as they take place, here. We are also sharing Ministerial Statements by several States, here on ICAO TV, written statements are shared here. For the full event schedule visit the HLCC website here, and stay up-to-date with the daily bulletins that are published here.

In his opening remarks to the virtual event, ICAO Council President Salvatore Sciacchitano stressed that as a result of the extraordinary and severe challenges facing global aviation and international air mobility due to the pandemic, the importance of the event's outcomes to international travel and trade, and to the prosperity and sustainability of economies everywhere, "cannot be overemphasized."

"This explains why we need new and even stronger multilateral commitments forged here that are aimed at safely restoring air travel, supporting industry and operational viability, and strengthening public and commercial confidence in travel and trade by air."

The 10-day ICAO Conference is expected to consider a broad range of issues, with a particular technical focus on safety and facilitation objectives in the pandemic context. It will also provide countries with an important and timely opportunity to promote and strengthen collective efforts to harmonize pandemic response measures and risk management strategies through the implementation of the recommendations by the ICAO Council Aviation Recovery Taskforce (CART).

In providing the Conference Overview at the onset of the proceedings, ICAO Secretary General Juan Carlos Salazar remarked on how the pandemic has had a substantial impact on aviation, with recovery having been both volatile and fragile and still largely confined to domestic travel and trade markets.

He noted that participants would consider proposals for States to use in tackling safety, operational and economic challenges, and streamlined policy responses to the post-pandemic state of aviation, and to

strengthen the multilateral cooperation and collective engagements which have been so important to weathering the pandemic storm until now.

Over 45 Ministers and Deputy Ministers joined the first HLCC Ministerial Roundtable today. It's anticipated that the chief outcome of the HLCC event will be a new Declaration outlining countries common global vision for aviation recovery, resilience and sustainability in support of reinvigorated global travel and trade.

New EUROCONTROL 2021-2027 forecast expects traffic recovery to 2019 levels by the end of 2023

Recovery to the 2019 number of flights in Europe could occur as early as 2023, according to a new forecast issued by EUROCONTROL. This forecast contains three scenarios and both the 'baseline' and 'high' scenarios show recovery to 2019 levels during the course of 2023, while this is delayed in the 'low' scenario until 2027. It updates and extends the forecast made in May 2021, before the summer season.

Eamonn Brennan, Director General EUROCONTROL, commented "Last year we had only five million flights but this summer has been very encouraging, with traffic close to our previous 'high' scenario and to airline expectations. As a result we expect to see about 6.2 million flights this year – still 44% fewer than we had in 2019. We are optimistic about traffic recovering to 2019 levels earlier than anticipated, with the baseline scenario indicating 9.8 million flights in 2022, just 11% down on 2019. But we must be aware that there are still significant downside risks that could affect the recovery"

The High scenario envisages the vaccination campaign continuing both within Europe and globally, with reliable vaccines that continue to be effective, including against variants. With a coordinated inter-regional approach, travel restrictions are relaxed, with most inter-regional flows restarting by the middle of 2022. Business travel recovers quickly in this scenario.

The Baseline scenario is similar but with flows outside Europe recovering rather more slowly (partly as the result of a lack of a coordinated inter-regional approach) and with business travel only recovering to pre-COVID levels in 2023.

The Low scenario considers the impact of several downside risks, such as slow/patchy vaccination rates, the need for new vaccines as a result of variants, the reintroduction of lockdown and similar measures, the continuation or re-imposition of travel restrictions, economic risks, including high energy prices and a long term drop in people's propensity to fly.

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FAA Task Force Features Aviation Museum Leaders

The Youth Access to American Jobs in Aviation Task Force held its fourth public meeting on Oct. 8, 2021. The meeting featured a Q&A session with Amy Spowart, president and CEO of the National Aviation Hall of Fame, and Jennifer Baxmeyer, executive director of the Cradle of Aviation Museum.

The Task Force, comprised of aviation leaders from industry and academia, is charged with providing independent recommendations and strategies to the Federal Aviation Administration (FAA) to educate youth on career opportunities in aviation. In addition, the Task Force will identify and recommend opportunities for apprenticeships, workforce-development programs and careers in the aviation for students.

"The work that the Youth in Aviation Task Force is doing to attract students to pursue careers in aviation is invaluable. They have included many industry leaders, supporters and voices to get a comprehensive picture for the best recommendations and advice. Our Museum is happy to have such wonderful allies tackling these industry issues." said Jennifer Baxmeyer, Executive Director, Cradle of Aviation Museum.

Focusing on U.S. high school students, these recommendations and strategies will be used to facilitate and encourage students to enroll in aviation career and technical education courses. These include aviation manufacturing and maintenance and science, technology, engineering, and mathematics (STEM).

"It is imperative that the Youth in Aviation Task Force and our partners from academia and industry find ways to meet youth where they are and ensure that all children have the opportunity to reach their dreams of a career in aviation." said Amy Spowart, president and CEO National Aviation Hall of Fame.

The Task Force will submit recommendations and strategies from their meetings to the FAA Administrator and the appropriate Congressional committees. To learn more about the Task Force, comment or get answers to your questions, please contact us at S602YouthTaskForce@faa.gov or visit the Task Force website.

FAA Ready for Increased Flights for the NBAA Convention

The Federal Aviation Administration (FAA) is ready for the influx of general aviation flights to Las Vegas for the National Business Aviation Association's convention in mid-October. The agency is working closely with federal, state and local agencies, airport officials and the aviation community to plan for safe, secure and efficient operations at Las Vegas-area airports.

The agency also is advising attendees who fly to the convention on charter flights to do their homework to ensure the operator is legitimate.

Air Traffic Management

The FAA anticipates hundreds of additional take-offs and landings and aircraft parked at Las Vegas-area airports from Oct. 12 to Oct. 14, 2021. Air traffic controllers may use traffic-management initiatives to efficiently move flights into Henderson Executive Airport (KHND), North Las Vegas Airport (KVGT) and Harry Reid (McCarran) International Airport (KLAS) in Las Vegas, Nev. These initiatives may include keeping airborne planes further apart than usual, and holding airplanes at their departure airports to slow the flow of aircraft arriving into Las Vegas-area airports. Local fixed-based operators (FBOs) may require a parking reservation. Pilots should contact the FBO directly for more information. The FAA also has established preferred arrival and departure routes for jet and turboprop aircraft operating at those airports. Details are posted at the FAA's NBAA Convention Air Traffic Procedures.

Safe Charter Operation

If you decide to charter an aircraft to fly to the NBAA convention, verify the operator's legitimacy before you book your flight. Ask to see the operator's Air Carrier or Operating Certificate to ensure they're a licensed charter operator.

Illegal air charter operations pose serious safety hazards, and the FAA works aggressively to identify and shut down rogue operators. Learn more about these efforts by visiting Safe Air Charter Operations and Chartering an Aircraft, A Consumer Guide to Help You Fly Smarter.

Operate Safely

Operators bringing cargo or passengers to the convention should ensure they are following proper procedures for carrying hazardous materials. Learn more about compliance and safety with dangerous goods at www.faa.gov/go/operatesafe. Additionally, exhibitors shipping items to the convention can learn more about safe shipping at www.faa.gov/go/safecargo

FAA Proposes $1.38 Million Civil Penalty Against

Campbell Oil & Associates in North and South Carolina

WASHINGTON – The U.S. Department of Transportation's Federal Aviation Administration (FAA) has proposed a $1.38 million civil penalty against Campbell Oil and other associated parties for allegedly conducting illegal charter flights.

The FAA alleges that between April 2017 and March 2019, the parties conducted approximately 154 paid passenger-carrying flights in two Cessna Citations and a Beechcraft King Air. The agency alleges that the parties did not have the required FAA operating or air carrier certificate. The parties also conducted flights without appropriate operations specifications, which outline what a company is authorized to do.

The FAA further alleges that the parties conducted operations with unqualified pilots who did not complete FAA-required training, testing, and competency checks.

The parties have 30 days to respond to the FAA after receiving the letter.

FAA Invests $479.1M in Safety, Sustainable Infrastructure at Airports

WASHINGTON – The U.S. Department of Transportation's Federal Aviation Administration (FAA) awarded more than $479 million in airport infrastructure grants to 123 projects at airports across all 50 states, American Samoa and Puerto Rico. View an interactive map with all the awards.

"These grants will help strengthen our country's airports and the communities they serve by making investments that create jobs and increase safety, sustainability and accessibility." U.S. Transportation Secretary Pete Buttigieg said.

Today's grants include:

Increasing accessibility

- Watertown International Airport, Watertown, N.Y.: $2.2 million to install an upgraded Approach Lighting System. Watertown International Airport recently completed a runway extension. This new Approach Lighting System will improve safety and enhance access to the Watertown area, especially in winter and for air carriers operating at this Essential Air Service airport.
- Harlem Airport, Harlem, Mont.: $2.1 million to rehabilitate its runway, taxiway, and apron pavement surfaces, and to rehabilitate its runway edge lighting system. The primary use of the Harlem Airport is to provide air ambulance service and to transport medical personnel for the Fort Belknap Hospital, which serves the Fort Belknap Indian Reservation.

Increasing sustainability and resilience

- General Edward Lawrence Logan International Airport, Boston, Mass.: $4 million to acquire electric charging stations for ground-servicing equipment. Boston Logan International Airport is located in an Environmental Protection Agency-designated nonattainment and maintenance area. This Voluntary Airport Low-Emission project will reduce sources of airport ground emissions, improve airport air quality, and reduce the use of conventional fuels.
- Warren "Bud" Woods Palmer Municipal Airport, Palmer, Alaska: $520,833 to improve airfield drainage and erosion control systems.
- New Orleans Lakefront Airport, New Orleans, La.: $543,056 to protect the airfield from floods due to high water level events of Lake Pontchartrain.
- Fairfield County Airport, Winnsboro, S.C.: $2.7 to use water infiltration to reduce airport runoff and help avoid shutting down runways during heavy rains.
- Denver International Airport, Denver, Colo.: $16.4 million towards the construction of a new 5,000 foot taxiway. Once open, this taxiway will reduce aircraft taxiing times from Runway 17L/35R to the terminal area, thereby decreasing aircraft emissions and improving airport air quality.

Create Jobs

- Stennis International Airport, Bay St. Louis, Miss.: Approximately $3.1 million to expand an apron to meet growing demand for aircraft parking and to support third party investment in hangar development. These new facilities will accommodate aircraft maintenance activity. These new facilities will support critical jobs on both the airfield and at the Stennis Space Center.
- Sarasota Bradenton International Airport, Sarasota, Fla.: Approximately $3.7 million to add five new gates and apron loading areas to the existing terminal. This expansion will accommodate existing demand, which was driven by four new airlines and 42 new routes. Accommodating the growing air traffic to the Sarasota/Bradenton area helps sustain job growth from new air service at the airport, as well as jobs in the community.
- Ontario International Airport, Ontario, Calif.: $15.2 million to reconstruct 832,000 square feet of taxiways and their connectors. The project will allow for a safer and more efficient flow of aircraft traffic on the airfield. This large project will result in jobs during construction and accommodate permanent job growth at this growing airport that is experiencing increased demand for passenger and cargo service.
- Chicago Rockford International Airport, Rockford, Ill.: Approximately $3 million to construct a taxiway. This airport has become the 19th busiest cargo destination in the United States, and this project continues the economic growth in the area by supporting increased cargo processing capacity. This project supports hundreds of new permanent jobs at the cargo companies operating on the airport.

Infrastructure Investment

- Buffalo Niagara International Airport, Buffalo, N.Y.: $13.3 million for a runway reconstruction project. This grant is one phase of a project that includes reconstruction of the full runway length, runway intersection, blast pads, and taxiways, all of which have been rapidly deteriorating. Reconstruction projects typically add up to 20 years of useful life to pavement.
- Ellison Onizuka Kona International Airport at Keahole, Kailua-Kona, Hawaii: $2.2 million to remove and replace 15,000 feet of airfield perimeter fence. Because of the airport's close proximity to the ocean, the existing metal fence is corroded and poses a security vulnerability to the airfield.

Today's funding is in addition to the more than $3.1 billion in Airport Improvement Program (AIP) grants awarded during fiscal year 2021 and includes American Rescue Plan Act funding to cover the usual local-match requirement.

Sites de surveillance

https://flightsafety.org/toolkits-resources/

https://aviation-safety.net

http://www.skybrary.aero

https://asrs.arc.nasa.gov/

Bulletin Officiel des Ministères de la Transition écologique et solidaire et de la Cohésion des territoires et des Relations avec les collectivités territoriales (developpement-durable.gouv.fr)

SIA - La référence en information aéronautique - Page d'accueil (aviation-civile.gouv.fr)

Info sécurité DGAC | Ministère de la Transition écologique (ecologie.gouv.fr)

http://www.developpement-durable.gouv.fr/Objectif-Securite-lebulletin.html

http://www.bea.aero/

http://ad.easa.europa.eu/sib-docs/page-1

https://www.easa.europa.eu/eccsa

http://www.jigonline.com/all-bulletins/

Accueil (defense.gouv.fr)

ECCSA - Technology Watch | EASA (europa.eu)

Cabinet d'Expertise en Aéronautique - Inscrit près la cour d'appel d'Amiens – Indépendant de l'EASA
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Risk Management Decision Path

PERCEIVE HAZARDS associated with:

- Pilot
- Aircraft
- enVironment
- External Factors

PROCESS RISK LEVEL by assessing:

- Consequences
- Alternatives
- Reality
- External Factors

PERFORM RISK MANAGEMENT by deciding whether to:

- Transfer
- Eliminate
- Accept
- Mitigate

For additional information go to:
faasafety.gov

For questions about aviation safety, contact:

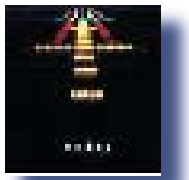
Your Local
Federal Aviation Administration
Flight Standards District Office

Prepared by the Department of Transportation
Federal Aviation Administration

Federal Aviation Administration

Practical Risk Management for Night VFR Flying

PURPOSE



Flying at night can be very enjoyable, if pilots understand the differences of night flying and take the necessary actions to prepare for a safe flight. This guide suggests ways to teach risk management for safe VFR flying at night.

PROFILE

Factors in night accidents often include errors in planning, decision-making, and risk management. Fatigue can contribute to such errors. Its effects include:

- "Channelized" attention
- Poor judgment
- Slowed reaction time
- Inattention
- Ease of distraction

Other errors common in night VFR accidents include:

- Lack of proper equipment (flashlights, batteries)
- Loss of situational awareness
- Problems with night vision
- Inadequate traffic scan
- Vulnerability to optical illusions

PRACTICES

Consider structuring a night training or proficiency session as a short cross-country flight, with night takeoff and landing practice at the destination airport. During each phase of the flight, look for (or create) "teachable moment" scenarios that provide an opportunity to teach good risk management practices for night VFR flying.

Sample Scenarios

1. Preflight: Ask the pilot to list hazards related to pilot (fatigue, night experience), aircraft (working lights), environment (airport lighting, terrain), and external pressures (closing times). Stress the importance of a thorough preflight that includes checking all essential lights and reviewing the location of key circuit breakers.

2. Taxi/Takeoff: Simulate an electrical failure during taxi to teach the importance of planning the taxi route, knowing the airport layout, and positioning a flashlight to illuminate the panel in case of electrical failure after takeoff. Use the Airport/Facility Directory to obtain the correct frequencies for activating lights.

3. Enroute: Consider diverting the flight due to simulated bad weather. Ask the pilot to select an alternate and explain why it is a safe choice. Encourage use of the Air Safety Foundation's Terrain Avoidance Planning tools, or carry IFR enroute charts to help stay above terrain. A VFR flight plan and VFR flight following are excellent practices for night VFR. If the flight takes place above 5,000 MSL, remind the pilot that oxygen can help night vision.

4. Descent/Approach: Be sure that the pilot understands the destination airport's runway layout and lighting. Where is the rotating beacon in relation to the runway or to terrain?

5. Landing/Parking: A new place can be confusing in darkness, so teach the pilot to keep a taxi diagram close by. During ground operations near other aircraft, do not use strobes or aim landing lights at other pilots.

Throughout the flight, ask the pilot to consider consequences of each decision, list alternative actions, recognize the reality of the situation, and be sensitive to any external pressures that can distract or drive an unsafe decision.

POSTFLIGHT

Use the postflight discussion to ask questions that let the pilot learn from his or her decisions. For instance:

- What part(s) of the flight made you uncomfortable?

- If you could change something you did, what would it be, and why?

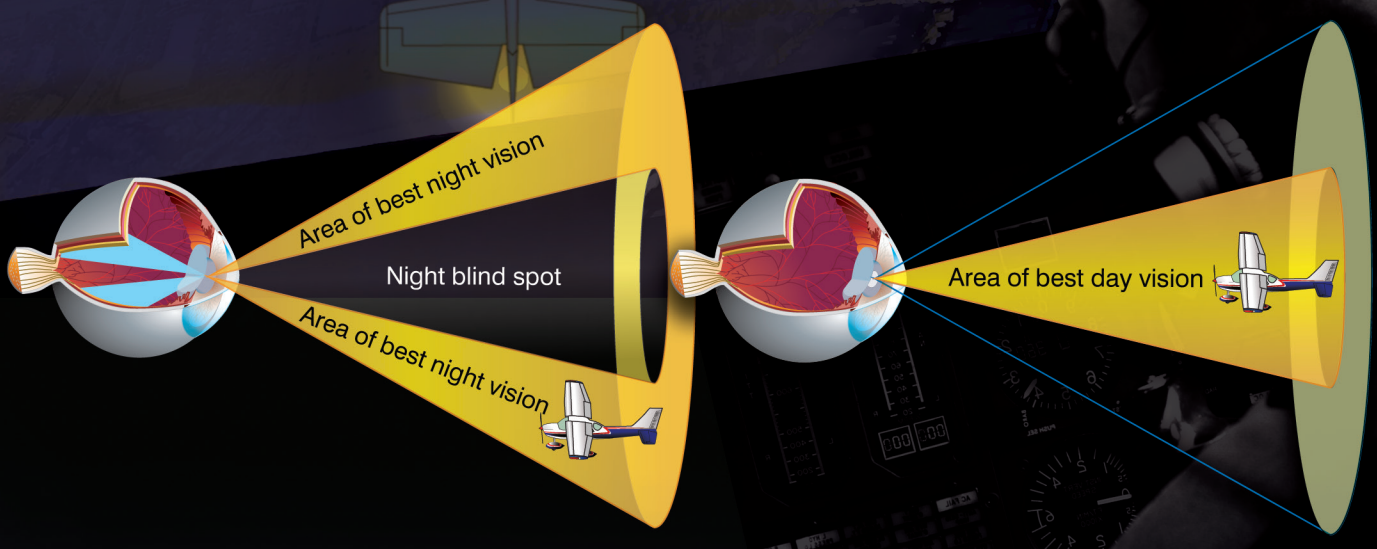
Chapter 10

Night Operations

Introduction

The mechanical operation of an airplane at night is no different than operating the same airplane during the day. The airplane does not know if it is being operated in the dark or bright sunlight. It performs and responds to control inputs by the pilot. The pilot, however, is affected by various aspects of night operations and must take them into consideration during night flight operations. Some are actual physical limitations affecting all pilots while others, such as equipment requirements, procedures, and emergency situations, must also be considered.

According to Title 14 of the Code of Federal Regulations (14 CFR) part 1, Definitions and Abbreviations, night is defined as the time between the end of evening civil twilight and the beginning of morning civil twilight. To explain further, morning civil twilight begins when the geometric center of the sun is 6° below the horizon and ends at sunrise. Evening civil twilight begins at sunset and ends when the geometric center of the sun reaches 6° below the horizon.



For 14 CFR part 61 operations, the term night refers to 1 hour after sunset and ending 1 hour before sunrise as 14 CFR part 61 explains that between those hours no person may act as pilot in command (PIC) of an aircraft carrying passengers unless within the preceding 90 days that person has made at least three takeoffs and three landings to a full stop during that night period.

Night flying operations should not be encouraged or attempted except by certificated pilots with knowledge of and experience in the topics discussed in this chapter.

Night Vision

Generally, most pilots are poorly informed about night vision. Human eyes never function as effectively at night as the eyes of animals with nocturnal habits, but if humans learn how to use their eyes correctly and know their limitations, night vision can be improved significantly.

The brain and eyes act as a team for a person to see well; both must be used effectively. Due to the physiology of the eye, limitations on sight are experienced in low light conditions, such as at night. To see at night, the eyes are used differently than during the day. Therefore, it is important to understand the eye's construction and how the eye is affected by darkness. Innumerable light-sensitive nerves called "cones" and "rods" are located at the back of the eye or retina, a layer upon which all images are focused. These nerves connect to the cells of the optic nerve, which transmits messages directly to the brain. The cones are located in the center of the retina, and the rods are concentrated in a ring around the cones. *[Figure 10-1]*

The function of the cones is to detect color, details, and faraway objects. The rods function when something is seen out of the corner of the eye or peripheral vision. They detect objects, particularly those that are moving, but do not give detail or color—only shades of gray. Both the cones and the rods are used for vision during daylight.

Although there is not a clear-cut division of function, the rods make night vision possible. The rods and cones function in daylight and in moonlight, but in the absence of normal light, the process of night vision is placed almost entirely on the rods. The rods are distributed in a band around the cones and do not lie directly behind the pupils, which makes off-center viewing (looking to one side of an object) important during night flight. During daylight, an object can be seen best by looking directly at it, but at night there is a blind spot in the center of the field of vision, the night blind spot. If an object is in this area, it may not be seen. The size of this blind spot increases as the distance between the eye and the object increases as illustrated in *Figure 10-1*. Therefore, the night blind spot can hide

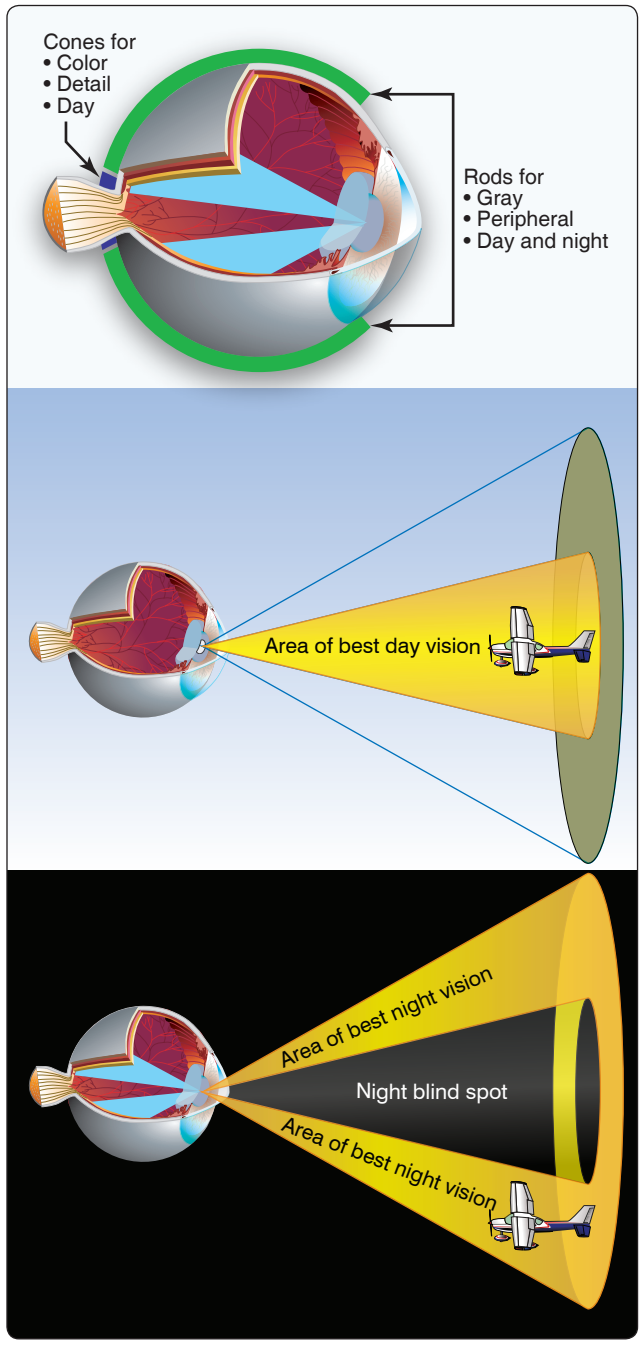


Figure 10-1. *Rods and cones.*

larger objects as the distance between the pilot and an object increases. Use of a scanning procedure to permit off-center viewing of the object is more effective. Consciously practice this scanning procedure to improve night vision.

The eye's adaptation to darkness is another important aspect of night vision. When a dark room is entered, it is difficult to see anything until the eyes become adjusted to the darkness. Almost everyone experiences this when entering a darkened movie theater. In this process, the pupils of the eyes first

enlarge to receive as much of the available light as possible. After approximately 5 to 10 minutes, the cones become adjusted to the dim light and the eyes become approximately 100 times more sensitive to the light than they were before the dark room was entered. Much more time, about 30 minutes, is needed for the rods to become adjusted to darkness, but when they do adjust, they are about 100,000 times more sensitive to light than they were in the lighted area. After the adaptation process is complete, much more can be seen, especially if scanning techniques are used correctly.

After the eyes have adapted to the dark, the entire process is reversed when entering a lighted room. The eyes are first dazzled by the brightness, but become completely adjusted in a very few seconds, thereby losing their adaptation to the dark. Now, if the dark room is re-entered, the eyes again go through the long process of adapting to the darkness.

Before and during night flight, the adaptation process of the eyes must be considered. First, adapt to the low level of light and then stay adapted. After the eyes are adapted to the darkness, avoid exposing them for more than one second to any bright white light as that causes temporary blindness. If exposed to a bright light source, such as search lights and landing lights, remember that each eye adapts to the dark independently. By closing or covering one eye when exposed to light, some night vision acuity is retained in the closed eye.

Temporary blindness, caused by an unusually bright light, may result in illusions or after images until the eyes recover from the brightness. The brain creates these illusions reported by the eyes. This results in misjudging or incorrectly identifying objects, such as mistaking slanted clouds for the horizon or populated areas for a landing field. Vertigo is experienced as a feeling of dizziness and imbalance that can create or increase illusions. The illusions seem very real and pilots at every level of experience and skill can be affected. Recognizing that the brain and eyes can play tricks in this manner is the best protection for flying at night.

Good eyesight depends upon physical condition. Fatigue, colds, vitamin deficiency, alcohol, stimulants, smoking, or medication can seriously impair vision. Keep these facts in mind and take adequate precautions to safeguard night vision. In addition to the principles previously discussed, the following items aid in increasing night vision effectiveness.

- Adapt the eyes to darkness prior to flight and keep them adapted. About 30 minutes is needed to adjust the eyes to maximum efficiency after exposure to a bright light.
- If oxygen is available, use it during night flying. Keep in mind that a significant deterioration in night vision can occur at cabin altitudes as low as 5,000 feet.
- Close one eye when exposed to bright light to help avoid the blinding effect.
- Do not wear sunglasses after sunset as this impairs night vision.
- Move the eyes more slowly than in daylight.
- Blink the eyes if they become blurred.
- Concentrate on seeing objects.
- Force the eyes to view off center using scanning techniques.
- Maintain good physical condition.
- Avoid smoking, drinking, and using drugs that may be harmful.

Night Illusions

In addition to night vision limitations, night illusions can cause confusion and distractions during night flying. The following discussion covers some of the common situations that cause illusions associated with night flying.

On a clear night, distant stationary lights can be mistaken for stars or other aircraft. Cloud layers or even the northern lights can confuse a pilot and indicate a false visual horizon. Certain geometrical patterns of ground lights, such as a freeway, runway, approach, or even lights on a moving train, can cause confusion. Dark nights tend to eliminate reference to a visual horizon. As a result, pilots need to rely less on outside references at night and more on flight and navigation instruments.

Visual autokinesis can occur when staring at a single light source for several seconds on a dark night. The result is that the light appears to be moving. The autokinesis effect will not occur if the visual field is expanded through scanning techniques. A good scanning procedure reduces the probability of vision becoming fixed on one source of light.

Distractions and problems can result from a flickering light in the flightdeck, anti-collision light, or other aircraft lights and can cause flicker vertigo. If continuous, the possible physical reactions can be nausea, dizziness, grogginess, unconsciousness, headaches, or confusion. Try to eliminate any light source causing blinking or flickering problems in the flightdeck.

A black-hole approach occurs when the landing is made from over water or non-lighted terrain where the runway lights are the only source of light. Without peripheral visual cues to help, orientation is difficult. The runway can seem out of position (down-sloping or up-sloping) and in the worst case, results in landing short of the runway. If an

electronic glide slope or visual approach slope indicator (VASI) is available, it should be used. If navigation aids (NAVAIDs) are unavailable, use the flight instruments to assist in maintaining orientation and a normal approach. Anytime position in relation to the runway or altitude is in doubt, execute a go-around.

Bright runway and approach lighting systems, especially where few lights illuminate the surrounding terrain, may create the illusion of being lower or having less distance to the runway. In this situation, the tendency is to fly a higher approach. Also, flying over terrain with only a few lights makes the runway recede or appear farther away. With this situation, the tendency is to fly a lower-than-normal approach. If the runway has a city in the distance on higher terrain, the tendency is to fly a lower-than-normal approach. A good review of the airfield layout and boundaries before initiating any approach helps maintain a safe approach angle.

Illusions created by runway lights result in a variety of problems. Bright lights or bold colors advance the runway, making it appear closer. Night landings are further complicated by the difficulty of judging distance and the possibility of confusing approach and runway lights. For example, when a double row of approach lights joins the boundary lights of the runway, there can be confusion where the approach lights terminate and runway lights begin. Under certain conditions, approach lights can make the aircraft seem higher in a turn to final, than when its wings are level.

Pilot Equipment

Before beginning a night flight, carefully consider personal equipment that should be readily available during the flight to include a flashlight, aeronautical charts and pertinent data for the flight, and a flightdeck checklist containing procedures for the following tasks, which can be found in 14 CFR part 91:

- Before starting engines
- Before takeoff
- Cruise
- Before landing
- After landing
- Stopping engines
- Emergencies

At least one reliable flashlight is recommended as standard equipment on all night flights. A reliable incandescent or light-emitting diode (LED) flashlight able to produce white/red light and blue for chart reading is preferable. The flash light should be large enough to be easily located in the event it is needed. The white light is used while performing the preflight visual inspection of the airplane, and the red light is used when performing cockpit operations. It is also recommended to have a spare set of batteries for the flashlight readily available.

Since the red light is non-glaring, it will not impair night vision. Some pilots prefer two flashlights, one with a white light for preflight and the other a penlight type with a red light. The latter can be suspended by a string from around the neck to ensure the light is always readily available. One word of caution: if a red light is used for reading an aeronautical chart, the red features of the chart will not show up.

Aeronautical charts are essential for night cross-country flight and, if the intended course is near the edge of the chart, the adjacent chart should also be available. The lights of cities and towns can be seen at surprising distances at night, and if this adjacent chart is not available to identify those landmarks, confusion could result. These checklist items are not just for night flying, they are required for day light flying also. Regardless of the equipment used, organization of the flightdeck eases the burden and enhances safety. Organize equipment and charts and place them within easy reach prior to taxiing.

Airplane Equipment and Lighting

Title 14 of the Code of Federal Regulations (14 CFR) part 91 specifies the basic minimum airplane equipment that is required for night flight. This equipment includes only basic instruments, lights, electrical energy source, and spare fuses.

The standard instruments required by 14 CFR part 91 for instrument flight are a valuable asset for aircraft control at night. Title 14 CFR part 91 specifies that during the period from sunset to sunrise operating aircraft are required to have a functioning anti-collision light system, including a flashing or rotating beacon and position lights. The anti-collision lights however need not be lighted when the pilot in command (PIC) determines that, because of operating conditions, it would be in the interest of safety to turn the lights off. Airplane position lights are arranged similar to those of boats and ships. A red light is positioned on the left wingtip, a green light on the right wingtip, and a white light on the tail. *[Figure 10-2]*

This arrangement provides a means to determine the general direction of movement of other airplanes in flight. If both a red and green light of another aircraft are observed, and the red light is on the left and the green to the right, the airplane is flying the same direction. Care must be taken not to overtake the other aircraft and maintain clearance. If red were on the right and green to the left, the airplane could be on a collision course.

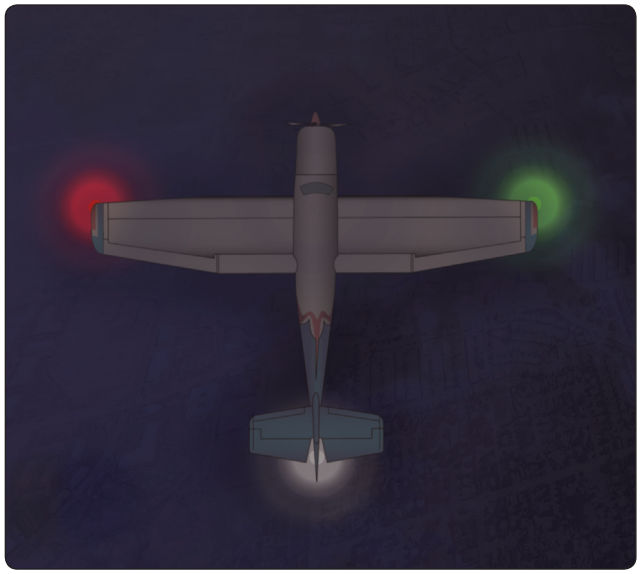


Figure 10-2. *Position lights.*

Landing lights are not only useful for taxi, takeoffs, and landings, but also provide a means by which airplanes can be seen at night by other pilots. Pilots are encouraged to turn on their landing lights when operating within 10 miles of an airport and below 10,000 feet. Operation lights on applies to both day and night or in conditions of reduced visibility. This should also be done in areas where flocks of birds may be expected.

Although turning on aircraft lights supports the "see and be seen" concept, do not become complacent about keeping a sharp lookout for other aircraft. Most aircraft lights blend in with the stars or the lights of the cities at night and go unnoticed unless a conscious effort is made to distinguish them from other lights.

Airport and Navigation Lighting Aids

The lighting systems used for airports, runways, obstructions, and other visual aids at night are other important aspects of night flying. Lighted airports located away from congested areas are identified readily at night by the lights outlining the runways. Airports located near or within large cities are often difficult to identify as the airport lights tend to blend with the city lights. It is important not to only know the exact location of an airport relative to the city, but also to be able to identify these airports by the characteristics of their lighting pattern.

Aeronautical lights are designed and installed in a variety of colors and configurations, each having its own purpose. Although some lights are used only during low ceiling and visibility conditions, this discussion includes only the lights that are fundamental to visual flight rules (VFR) night operation.

It is recommended that prior to a night flight, and particularly a cross-country night flight, that a check of the availability and status of lighting systems at the destination airport is made. This information can be found on aeronautical charts and in the Chart Supplements. The status of each facility can be determined by reviewing pertinent Notices to Airmen (NOTAMs).

Most airports have rotating beacons. The beacon rotates at a constant speed, thus producing a series of light flashes at regular intervals. These flashes may consist of a white flash and one or two different colors that are used to identify various types of landing areas. For example:

- Lighted civilian land airports—alternating white and green lights
- Lighted civilian water airports—alternating white and yellow lights
- Lighted military airports—alternating white and green lights, but are differentiated from civil airports by dual peaked (two quick) white flashes, then green

Beacons producing red flashes indicate obstructions or areas considered hazardous to aerial navigation. Steady-burning red lights are used to mark obstructions on or near airports and sometimes to supplement flashing lights on en route obstructions. High-intensity, flashing white lights are used to mark some supporting structures of overhead transmission lines that stretch across rivers, chasms, and gorges. These high-intensity lights are also used to identify tall structures, such as chimneys and towers.

As a result of technological advancements, runway lighting systems have become quite sophisticated to accommodate takeoffs and landings in various weather conditions. However, if flying is limited to VFR only, it is important to be familiar with the basic lighting of runways and taxiways.

The basic runway lighting system consists of two straight parallel lines of runway edge lights defining the lateral limits of the runway. These lights are aviation white, although aviation yellow may be substituted for a distance of 2,000 feet from the far end of the runway to indicate a caution zone. At some airports, the intensity of the runway edge lights can be activated and adjusted by radio control. The control system consists of a 3-step control responsive to 7, 5, and/or 3 microphone clicks. This 3-step control turns on lighting facilities capable of either 3-step, 2-step, or 1-step operation. The 3-step and 2-step lighting facilities can be altered in intensity, while the 1-step cannot. All lighting is illuminated for a period of 15 minutes from the most recent time of activation and may not be extinguished prior to end of the 15-minute period. Suggested

use is to always initially key the mike 7 times; this assures that all controlled lights are turned on to the maximum available intensity. If desired, adjustment can then be made, where the capability is provided, to a lower intensity by keying 5 and/or 3 times. Due to the close proximity of airports using the same frequency, radio-controlled lighting receivers may be set at a low sensitivity requiring the aircraft to be relatively close to activate the system. Consequently, even when lights are on, always key the mike as directed when overflying an airport of intended landing or just prior to entering the final segment of an approach. This assures the aircraft is close enough to activate the system and a full 15-minute lighting duration is available.

The length limits of the runway are defined by straight lines of lights across the runway ends. At some airports, the runway threshold lights are aviation green, and the runway end lights are aviation red. At many airports, the taxiways are also lighted. A taxiway edge lighting system consists of blue lights that outline the usable limits of taxi paths.

Training for Night Flight

Learning to safely fly at night takes time and your proficiency will improve with experience. Pilot's should practice the following maneuvers at night and acquire competency in straight-and-level flight, climbs and descents, level turns, climbing and descending turns, and steep turns. Practicing recovery from unusual attitudes should only be done with a flight instructor. Practice these maneuvers with all the flightdeck lights turned OFF, as well as ON. This blackout training simulates an electrical or instrument light failure. Include using the navigation equipment and local NAVAIDs during the training. In spite of fewer references or checkpoints, night cross-country flights do not present particular problems if pre-planning is adequate. Continuously monitor position, time estimates, and fuel consumed. Use NAVAIDs, if available, to assist in monitoring en route progress.

Preparation and Preflight

Night flying requires that pilots are aware of, and operate within, their abilities and limitations. Although careful planning of any flight is essential, night flying demands more attention to the details of preflight preparation and planning.

Preparation for a night flight includes a thorough review of the available weather reports and forecasts with particular attention given to temperature/dew point spread. A narrow temperature/dew point spread may indicate the possibility of fog. Emphasis should also be placed on wind direction and speed, since its effect on the airplane cannot be as easily detected at night as during the day.

On night cross-country flights, select and use appropriate aeronautical charts to include the appropriate adjacent charts. Course lines should be drawn in black to be more distinguishable in low-light conditions. Note prominently lighted checkpoints along the prepared course. Rotating beacons at airports, lighted obstructions, lights of cities or towns, and lights from major highway traffic all provide excellent visual checkpoints. If a global positioning system (GPS) is being used for navigation, ensure that it is working properly before the flight. All necessary waypoints should be loaded properly before the flight and the database should be checked for accuracy prior to taking off and then checked again once in flight. The use of radio navigation aids and communication facilities add significantly to the safety and efficiency of night flying.

Check all personal equipment prior to flight to ensure proper functioning and operation. All airplane lights should be checked for operation by turning them on momentarily during the preflight inspection. Position lights can be checked for loose connections by tapping the light fixture. If the lights blink while being tapped, determine the cause prior to flight. Parking ramps should be checked with a flashlight prior to entering the airplane. During the day, it is quite easy to see stepladders, chuckholes, wheel chocks, and other obstructions, but at night, it is more difficult and a check of the area can prevent taxiing mishaps.

Starting, Taxiing, and Runup

Once seated in the airplane and prior to starting the engine, arrange all items and materials to be used during the flight so they will be readily available and convenient to use. Take extra caution at night to assure the propeller area is clear. Turning the rotating beacon ON, or flashing the airplane position lights serves to alert persons nearby to remain clear of the propeller. To avoid excessive drain of electrical current from the battery, it is recommended that unnecessary electrical equipment be turned OFF until after the engine has been started.

After starting the engine and when ready to taxi, turn the taxi or landing light ON. Be aware that continuous use of the landing light with revolutions per minute (rpm) power settings normally used for taxiing may place an excessive drain on the airplane's electrical system. Also, overheating of the landing light is possible because of inadequate airflow to carry the heat away. Use landing lights only as necessary while taxiing. When using lights, consideration should be given to not blinding other pilots. Taxi slowly, particularly in congested areas. If taxi lines are painted on the ramp or taxiway, follow the lines to ensure a proper path along the route.

Use the checklist for the before takeoff and run-up checks and procedures. During the day, forward movement of the airplane can be detected easily. At night, the airplane could creep forward without being noticed unless the pilot is alert

for this possibility. Hold or lock the brakes during the run-up and be alert for any forward movement. An instrument check should be done while taxiing to check for proper and correct operation prior to takeoff.

Takeoff and Climb

Night flying is very different from day flying and demands more attention of the pilot. The most noticeable difference is the limited availability of outside visual references. Therefore, flight instruments should be used to a greater degree in controlling the airplane. This is particularly true on night takeoffs and climbs. Adjust the flightdeck lights to a minimum brightness that allow reading the instruments and switches but not hinder outside vision. This also eliminates light reflections on the windshield and windows.

After ensuring that the final approach and runway are clear of other air traffic, or when cleared for takeoff by the air traffic controller, turn the landing and taxi lights ON and line the airplane up with the centerline of the runway. If the runway does not have centerline lighting, use the painted centerline and the runway edge lights. After the airplane is aligned, note the heading indicator and set to correspond to the known runway direction. To begin the takeoff, release the brakes and advance the throttle smoothly to maximum allowable power. As the airplane accelerates, it should be kept moving straight ahead between and parallel to the runway edge lights.

The procedure for night takeoffs is the same as for normal daytime takeoffs except that many of the runway visual cues are not available. Check the flight instruments frequently during the takeoff to ensure the proper pitch attitude, heading, and airspeed are being attained. As the airspeed reaches the normal lift-off speed, adjust the pitch attitude to establish a normal climb. Accomplish this by referring to both outside visual references, such as lights, and to the flight instruments. *[Figure 10-3]*

Figure 10-3. *Establish a positive climb.*

After becoming airborne, the darkness of night often makes it difficult to note whether the airplane is getting closer to or farther from the surface. To ensure the airplane continues in a positive climb, be sure a climb is indicated on the attitude indicator, vertical speed indicator (VSI), and altimeter. It is also important to ensure the airspeed is at best climb speed.

Make necessary pitch and bank adjustments by referencing the attitude and heading indicators. It is recommended that turns not be made until reaching a safe maneuvering altitude. Although the use of the landing lights is helpful during the takeoff, they become ineffective after the airplane has climbed to an altitude where the light beam no longer extends to the surface. The light can cause distortion when it is reflected by haze, smoke, or clouds that might exist in the climb. Therefore, when the landing light is used for the takeoff, turn it off after the climb is well established provided it is not being used for collision avoidance.

Orientation and Navigation

Generally, at night, it is difficult to see clouds and restrictions to visibility, particularly on dark nights or under overcast. When flying under VFR, pilots must exercise caution to avoid flying into clouds. Usually, the first indication of flying into restricted visibility conditions is the gradual disappearance of lights on the ground. If the lights begin to take on an appearance of being surrounded by a halo or glow, use caution in attempting further flight in that same direction. Such a halo or glow around lights on the ground is indicative of ground fog. Remember that if a descent must be made through clouds, smoke, or haze in order to land, the horizontal visibility is considerably less when looking through the restriction than it is when looking straight down through it from above. Under no circumstances should a VFR night flight be made during poor or marginal weather conditions unless both the pilot and aircraft are certificated and equipped for flight under instrument flight rules (IFR).

Crossing large bodies of water at night in single-engine airplanes could be potentially hazardous, in the event of an engine failure, the pilot may not have any option than to land (ditch) the airplane in the water. Another hazard faced by pilots of all aircraft, due to limited or no lighting, is that the horizon blends with the water. During poor visibility conditions over water, the horizon becomes obscure and may result in a loss of orientation. Even on clear nights, the stars may be reflected on the water surface, which could appear as a continuous array of lights, thus making the horizon difficult to identify.

Lighted runways, buildings, or other objects may cause illusions to the pilot when seen from different altitudes. At an altitude of 2,000 feet, a group of lights on an object may be seen individually, while at 5,000 feet or higher, the same lights could appear to be one solid light mass. These illusions may become quite acute with altitude changes and, if not overcome, could present problems in respect to approaches to lighted runways.

Approaches and Landings

When approaching the airport to enter the traffic pattern and land, it is important that the runway lights and other airport lighting be identified as early as possible. If the airport layout is unfamiliar, sighting of the runway may be difficult until very close-in due to the maze of lights observed in the area. *[Figure 10-4]* Fly toward the rotating beacon until the lights outlining the runway are distinguishable. To fly a traffic pattern of proper size and direction, the runway threshold and runway-edge lights must be positively identified. Once the airport lights are seen, these lights should be kept in sight throughout the approach.

Distance may be deceptive at night due to limited lighting conditions. A lack of intervening references on the ground and the inability to compare the size and location of different ground objects cause this. This also applies to the estimation of altitude and speed. Consequently, more dependence must be placed on flight instruments, particularly the altimeter and the airspeed indicator. When entering the traffic pattern, always give yourself plenty of time to complete the before landing checklist. If the heading indicator contains a heading bug, setting it to the runway heading is an excellent reference for the pattern legs.

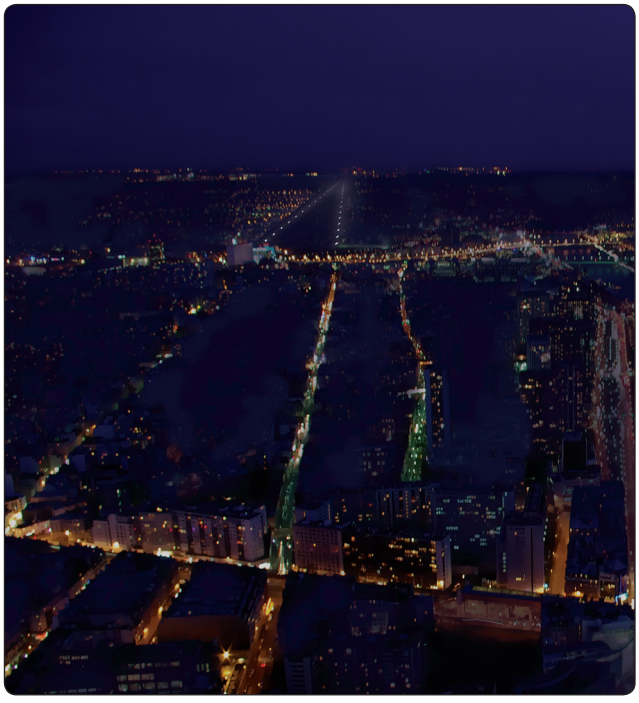


Figure 10-4. *Use light patterns for orientation.*

Maintain the recommended airspeeds and execute the approach and landing in the same manner as during the day. A low, shallow approach is definitely inappropriate during a night operation. The altimeter and VSI should be constantly cross-checked against the airplane's position along the base leg and final approach. A visual approach slope indicator (VASI) is an indispensable aid in establishing and maintaining a proper glide path. *[Figure 10-5]*

After turning onto the final approach and aligning the airplane midway between the two rows of runway-edge lights, note and correct for any wind drift. Throughout the final approach, use pitch and power to maintain a stabilized approach. Flaps are used the same as in a normal approach. Usually, halfway through the final approach, the landing light is turned on. Earlier use of the landing light may be necessary because of "Operation Lights ON" or for local traffic considerations. The landing light is sometimes ineffective since the light beam will usually not reach the ground from higher altitudes. The light may even be reflected back into the pilot's eyes by any existing haze, smoke, or fog. This disadvantage is overshadowed by the safety considerations provided by using the "Operation Lights ON" procedure around other traffic.

The round out and touchdown is made in the same manner as in day landings. At night, the judgment of height, speed, and sink rate is impaired by the scarcity of observable objects in the landing area. An inexperienced pilot may have a tendency

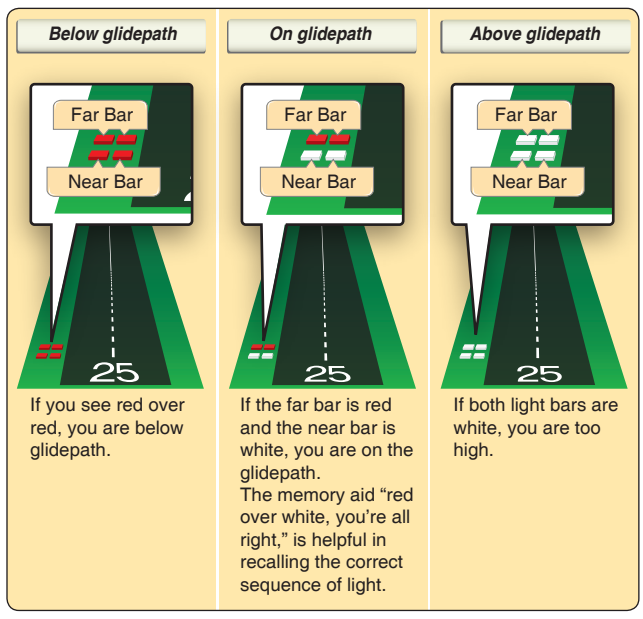


Figure 10-5. *VASI.*

to round out too high until attaining familiarity with the proper height for the correct round out. To aid in determining the proper round out point, continue a constant approach descent until the landing lights reflect on the runway and tire marks on the runway can be seen clearly. At this point, the round out is started smoothly and the throttle gradually reduced to idle as the airplane is touching down. *[Figure 10-6]* During landings without the use of landing lights, the round out may be started when the runway lights at the far end of the runway first appear to be rising higher than the nose of the airplane. This demands a smooth and very timely round out and requires that the pilot feel for the runway surface using power and pitch changes, as necessary, for the airplane to settle slowly to the runway. Blackout landings should always be included in night pilot training as an emergency procedure.

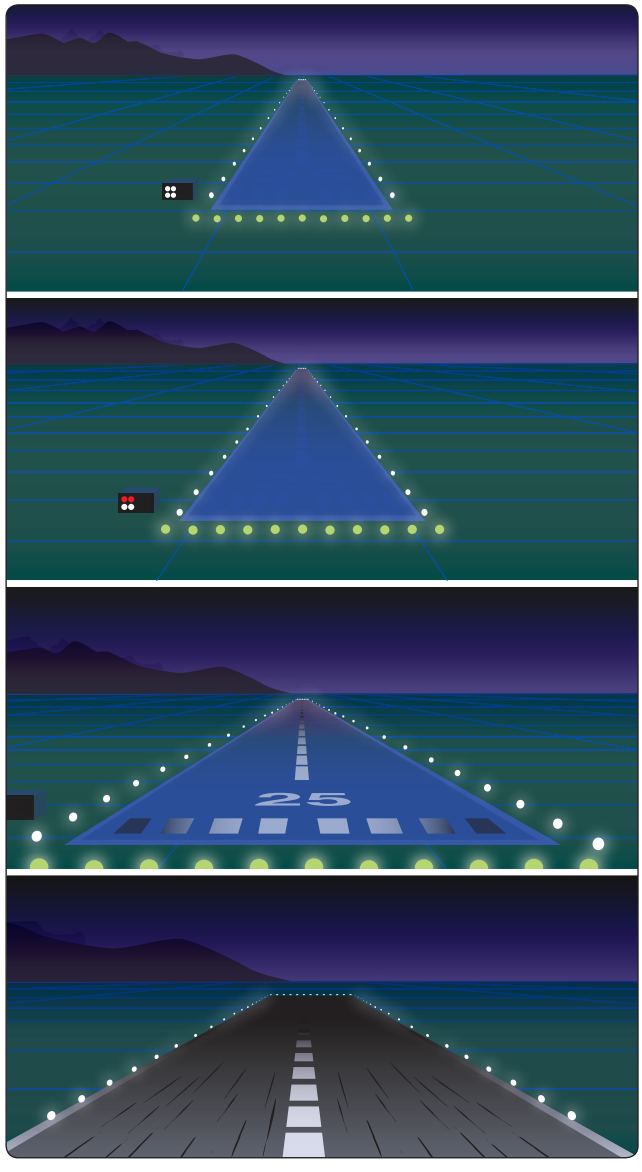


Figure 10-6. *Roundout when tire marks are visible.*

Night Emergencies

Perhaps the greatest concern about flying a single-engine airplane at night is the possibility of a complete engine failure and the subsequent emergency landing. This is a legitimate concern, even though continuing flight into adverse weather and poor pilot judgment account for most serious accidents.

If the engine fails at night, there are several important procedures and considerations to keep in mind. They are as follows:

- Maintain positive control of the airplane and establish the best glide configuration and airspeed. Turn the airplane towards an airport or away from congested areas.
- Check to determine the cause of the engine malfunction, such as the position of fuel selectors, magneto switch, or primer. If possible, the cause of the malfunction should be corrected immediately and the engine restarted.
- Announce the emergency situation to air traffic control (ATC) or Universal Communications (UNICOM). If already in radio contact with a facility, do not change frequencies unless instructed to change.
- If the condition of the nearby terrain is known and is suitable for a forced landing, turn towards an unlighted portion of the area and plan an emergency forced landing to an unlighted portion.
- Consider an emergency landing area close to public access if possible. This may facilitate rescue or help, if needed.
- Maintain orientation with the wind to avoid a downwind landing.
- Complete the before landing checklist, and check the landing lights for operation at altitude and turn ON in sufficient time to illuminate the terrain or obstacles along the flightpath. The landing should be completed in the normal landing attitude at the slowest possible airspeed. If the landing lights are unusable and outside visual references are not available, the airplane should be held in level-landing attitude until the ground is contacted.
- After landing, turn off all switches and evacuate the airplane as quickly as possible.

Chapter Summary

Night operations present additional risks that must be identified and assessed. Night flying operations should not be encouraged or attempted, except by pilots that are certificated, current, and proficient in night flying. Prior to

attempting night operations, pilots should receive training and be familiar with the risks associated with night flight and how they differ from daylight operations. Even for experienced pilots, night VFR operations should only be conducted in unrestricted visibility, favorable winds, both on the surface and aloft, and no turbulence. Additional information on pilot vision and illusions can be found in FAA brochure AM-400-98/2 and also Chapters 2 and 17 of the Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25A) at www.faa.gov. Additional information on lighting aids can be found in Chapter 2 of the Aeronautical Information Manual (AIM), which can be accessed at www.faa.gov.

Mission+ v1.0 for iPadOS – EASA EFB Evaluation Letter

Date: 23.07.2021

To whomever it may concern,

Airbus has applied to EASA for an operational evaluation of the Mission+ software application developed by Navblue for iPadOS. The application Mission+ provides the flight crew with the following functions: flight mission data (OFP, NOTAMs, NOTOC, Pre-flight calculations, etc), enroute moving map (with own-ship depiction), terminal charts, and airport moving map (with own-ship depiction).

EASA evaluation was based on data provided by Airbus as well as sample trials on an EFB. The requirements contained in Commission Regulation (EU) N° 965/2012 of 5 October 2012 (air operations rules), as amended to this date, have been considered.

The main objective of the evaluation was to assess compliance with the applicable guidance, guidelines and limitations, and evaluate the associated compliance data proposed by Airbus and agree on recommendations to the operators in terms of EFB training, procedures, and administration.

Airbus publishes the Mission+ User and Compliance Manual (Ref.NAVB.TEC.21.0053.01, issue 1.0 dated 9 July 2021), which contains important considerations and recommendations for the use of the Mission+ application in compliance with air operations rules and AMC. The manual covers in particular considerations on the EFB hardware, backup means, V&V process, administration, security, flight crew procedures and training, and risk assessment.

EASA recommends operators to take into account the considerations and recommendations provided in the user and compliance manual. In particular, EASA recommends paying attention to any customisation of the application by the operator and to ensure that the training highlights that performance data shown in the flight briefing module is for post-flight report use only.

Based on the verifications conducted, EASA has no technical objection to the grant by the national authorities of an operational approval for the use of the Mission+ application, for all functions mentioned above, or a subset thereof as selected by the operator, and provided that the recommendations mentioned in this letter are considered.

This letter does not constitute an operational approval and operators remain responsible for demonstrating compliance with the air operations rules and corresponding AMC to their competent authorities through the establishment of a detailed compliance checklist. EASA recommends for this purpose to consider chapter 11.4 of the user and compliance manual, which proposes means of compliance elements and highlights areas of operator responsibility.

Sincerely,

Special Aeroplanes & Projects section manager
Stefan Ronig

cc.: EASA: Dimitri Garbi

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50452 Cologne, Germany
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Supporting European Aviation

EUROCONTROL

EUROCONTROL Forecast Update 2021-2027

European Flight Movements and Service Units

Three Scenarios for Recovery from COVID-19

STATFOR - Oct 2021

FOUNDING MEMBER SESAR JOINT UNDERTAKING

NETWORK MANAGER

The October 2021 forecast is a 7-year forecast that covers the horizon 2021-2027

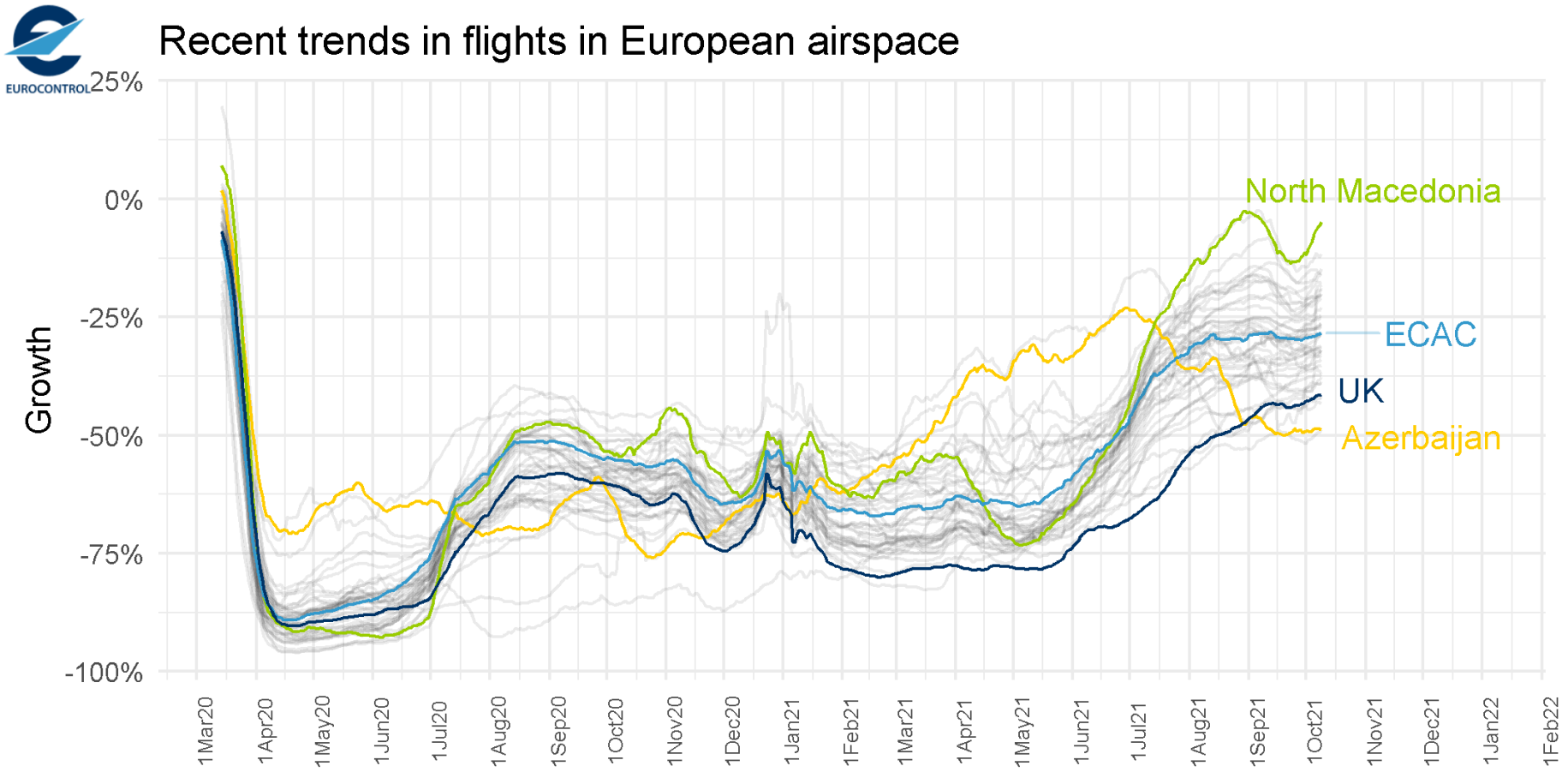
The October 2021 forecast takes into account the following updated inputs:

- Traffic trends: Current traffic flows still strongly impacted by COVID-19.
- Economic growth: Latest revision of the economic forecast (Oxford Economics August 2021 release).
-  Update of the existing three scenarios accounting for COVID-19 impact and timing of recovery.

This forecast replaces the May 2021 forecast and covers 7 years.

Traffic trends

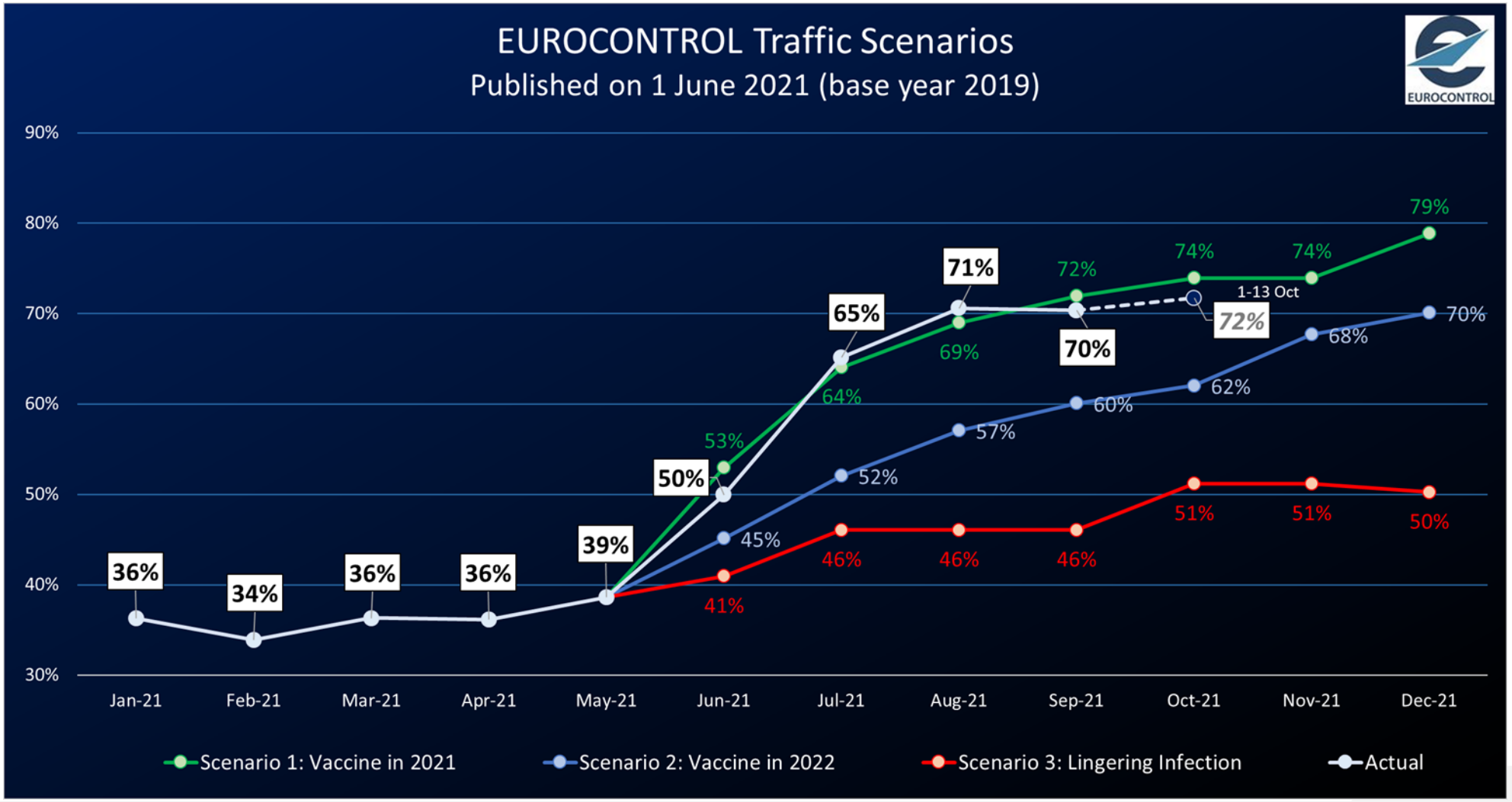
Since the beginning of 2021, there were 50% fewer flights than in 2019



Each line is a national airspace. Smoothing: 14 steps.

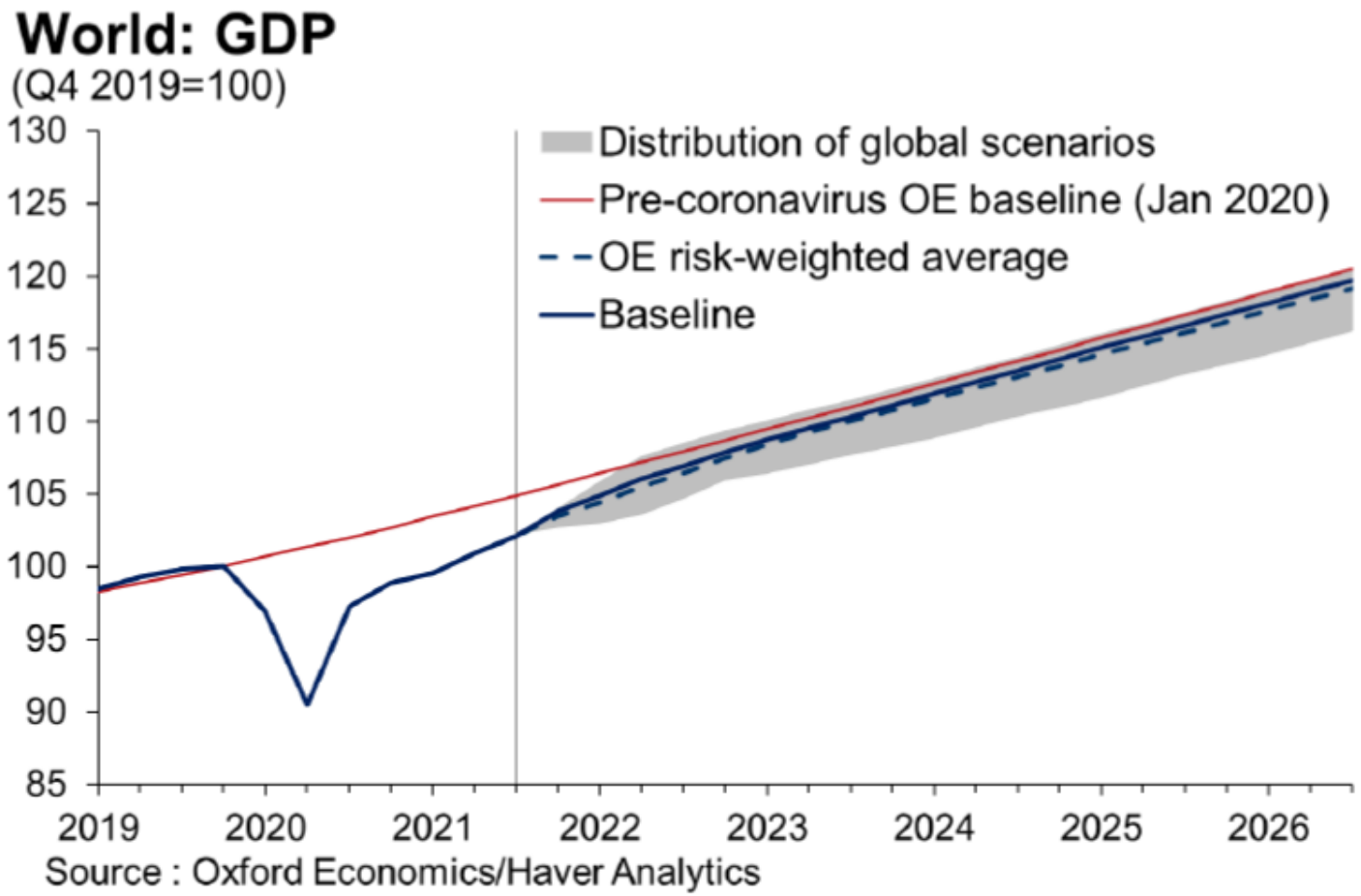
Traffic trends

Current traffic growth is in line with previous Scenario 1



Macro-economic impact

Risk to the GDP forecast still lie to the downside

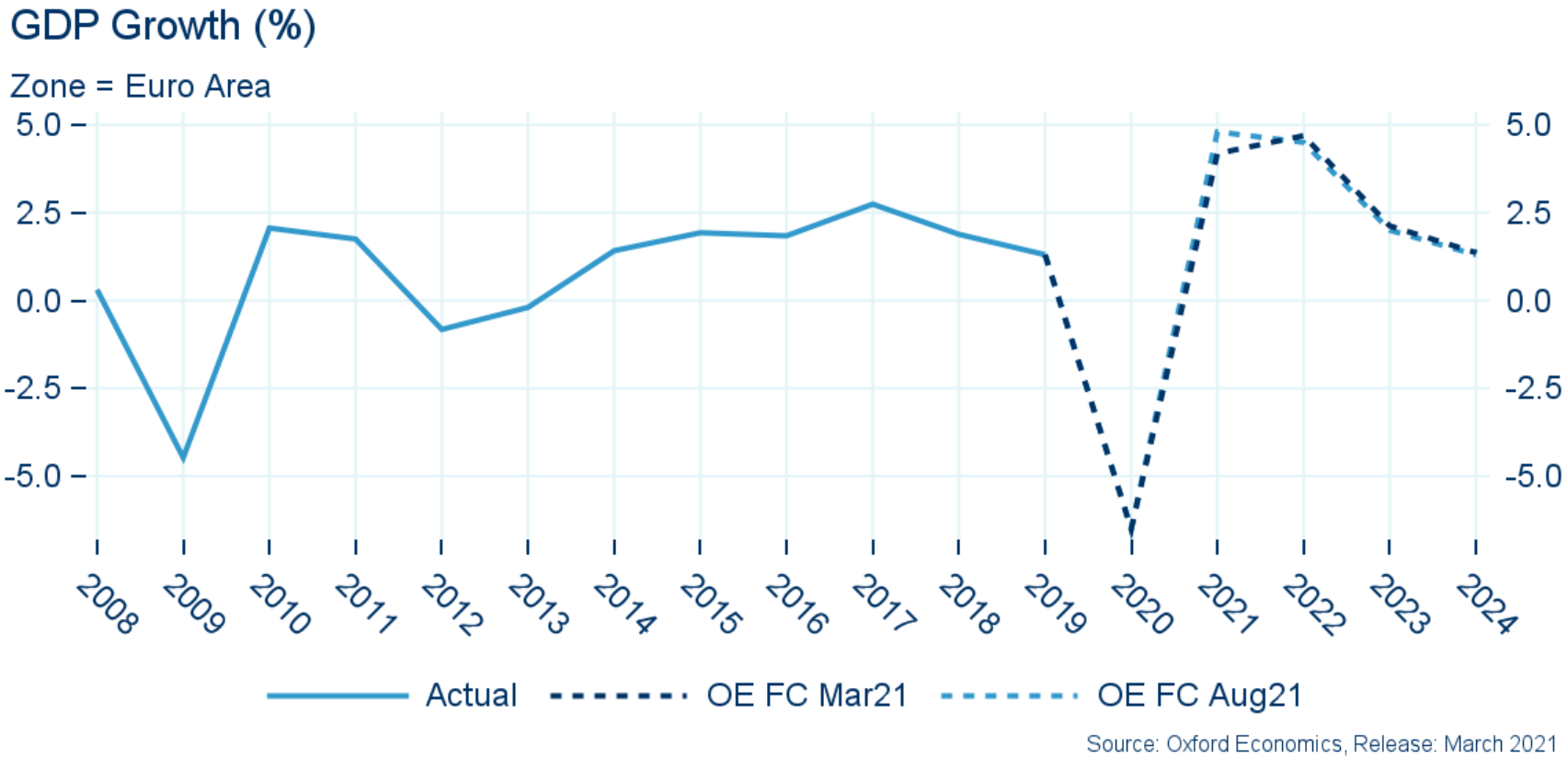


Three scenarios are considered with greater or lesser long-term economic damage:

- **Consumer boom:** Consumer spending quickly their savings accumulated during the pandemic fueling a sharp consumer-led rebound in the global economy
- **Base scenario**
- **Return of inflation:** Deteriorating outlook for inflation with a sharp and sustained rise in bond yields

Macro-economic impact

The GDP baseline forecast for 2021 has been slightly revised upward



The rise in Covid-19 cases due to the **spread of the Delta variant** is the key global concerns of the economic growth in Europe as well as in the rest of the world.

Scenario Update COVID-19 recovery

Drivers of the recovery during the forecast horizons

2020 → 2021 → 2022 → 2023 - …

Epidemiology

Vaccines roll-out
Vaccines effectiveness
Non-pharmaceutical interventions

Impact on aviation

Travel restriction
Coordinated approach
Recovery of long-haul
Consumer behaviour shifts by travel purpose (business travel, VFR, leisure)
Ability of airports to restart (supply-side)

Macro-economic impact

GDP

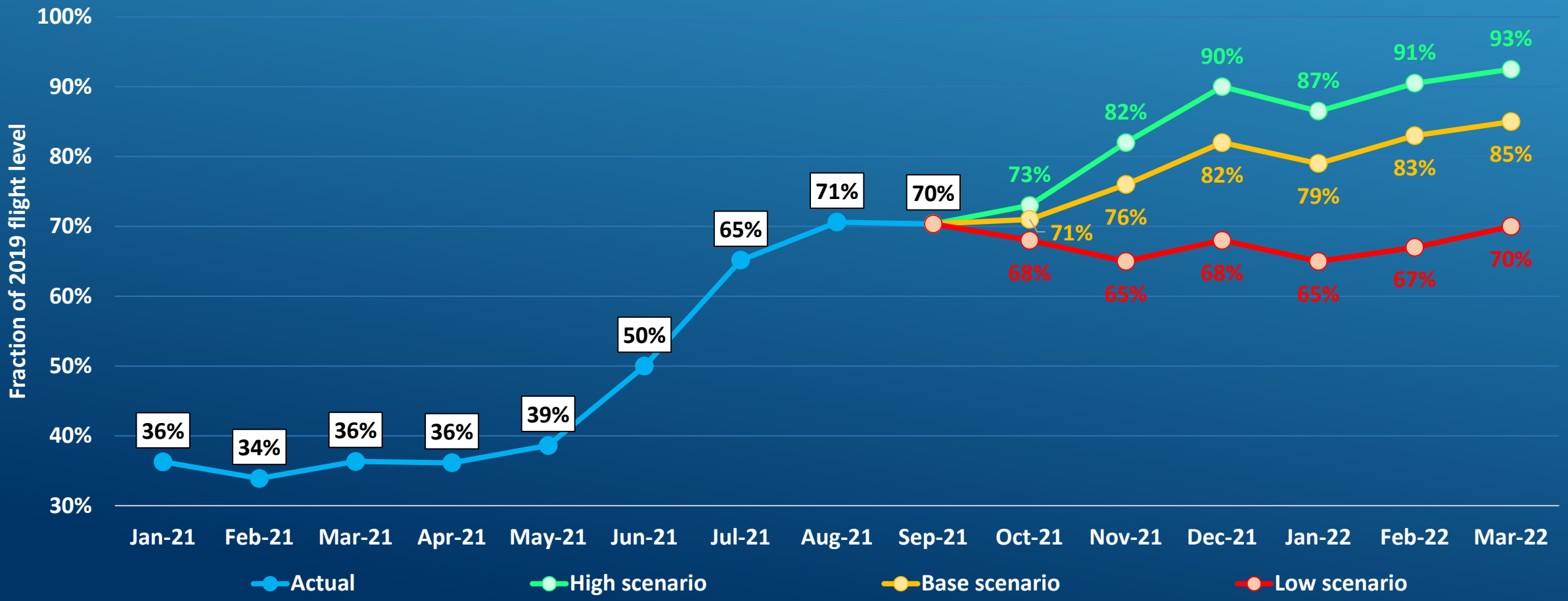
Scenario Update COVID-19 recovery

Optimistic and pessimistic scenarios are explored

	High scenario **Recovery to 2019 level in mid-2023**	Baseline scenario **Recovery to 2019 level by end 2023**	Low scenario **Recovery to 2019 level after 2027**
Epidemiology	• Efficient vaccination campaign within Europe and globally • Reliable vaccine (also against variants) • Effective test-trace-isolate programme	• Vaccine roll-out reaching herd immunity levels within Europe • Reliable vaccine (also against variants) • Effective test-trace-isolate programme	• Patchy uptake of vaccine • Need of updated vaccines • Frequent reintroduction of lockdowns and mask mandates
Specific impact on aviation	• Less travel restriction • Coordinated interregional approach • North-Atlantic flows restarting during November 2021 • Asia-Pacific/India Q2 2022, Middle-East Q4 2021, Australia flows Q3 2022 • Good passenger confidence • Savings glut/Pent-up demand • Faster bounce-back of business travel • Airports well able to bring back capacity	• Limited travel restriction • Coordinated European approach • North-Atlantic flows restarting during November 2021 • Asia-Pacific/India Q3 2022, Middle-East Q1 2022, Australia flows Q4 2022 • Relatively good passenger confidence • Savings glut/Pent-up demand • Business travel return to pre-COVID19 levels in 2023 • Airports well able to bring back capacity	• Strong travel restriction • Coordinated European approach • Long-haul flows restarting as of end 2022 • Demand is bouncing back for 60-70% of travelers but reluctance to fly for rest; Permanent drop in propensity to fly; Growing environmental constraint • Airport difficulties to operate as pre-COVID

EUROCONTROL short-term traffic scenario for *Europe until March 2022

% traffic compared to 2019

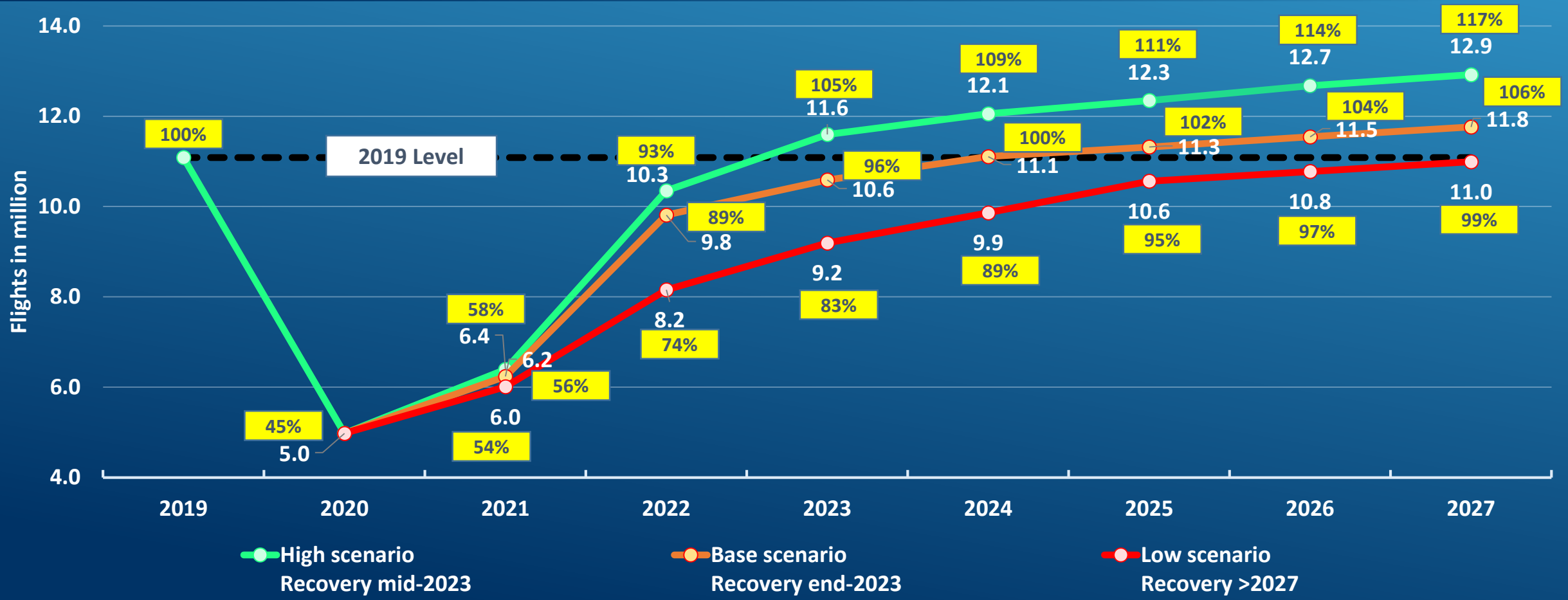


* Europe = ECAC 44 Member States

Source: EUROCONTROL, Short-term traffic scenario October 2021

EUROCONTROL STATFOR 7-year forecast for *Europe 2021-2027

Actual and future IFR movements, % traffic compared to 2019



* Europe = ECAC 44 Member States

Source: EUROCONTROL, 7-year Forecast October 2021

Flight Forecast

Summary of flight forecast for Europe (ECAC)

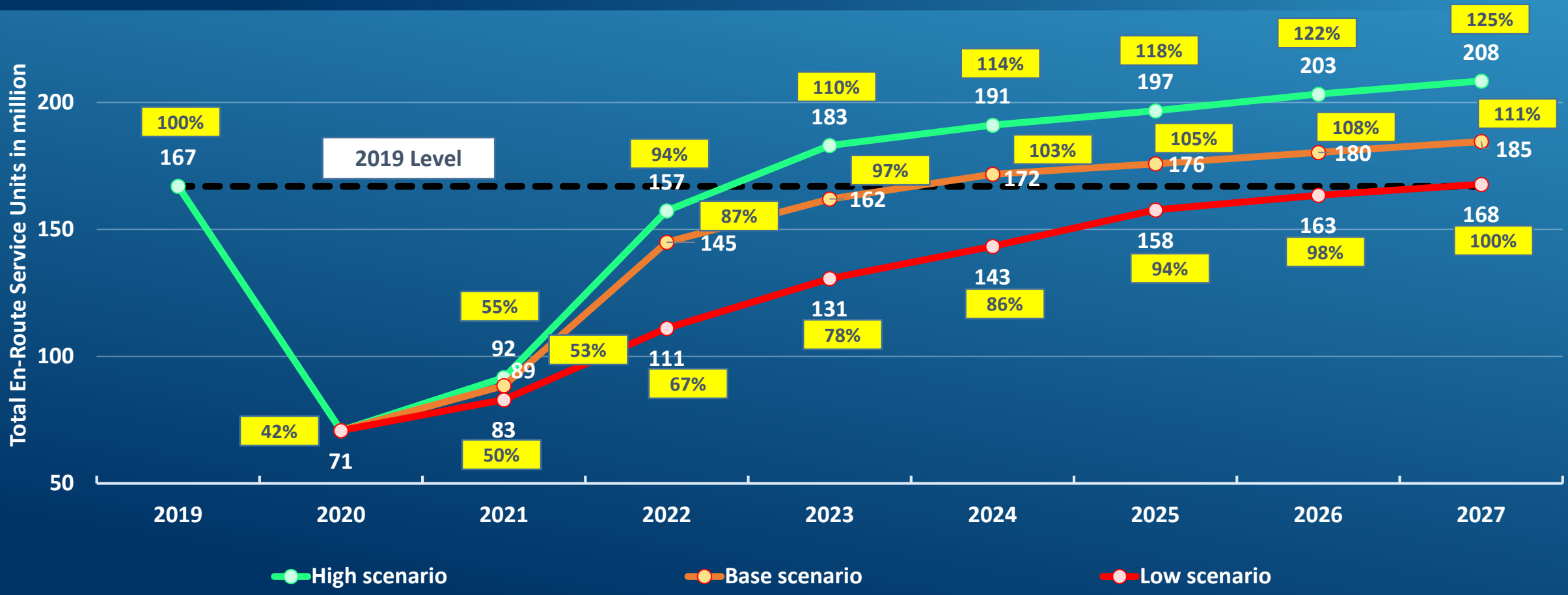
ECAC*		2014	2015	2016	2017	2018	2019	2020**	2021	2022	2023	2024**	2025	2026	2027	AAGR 2020-2027 (vs 2019)	AAGR RP3 2020-2024
IFR Flight Movements (Thousands)	High	.	.	.	.	.	.	.	6,392	10,349	11,595	12,054	12,348	12,676	12,919	1.9%	1.7%
	Base	9,770	9,923	10,197	10,604	11,002	11,085	4,979	6,238	9,812	10,588	11,106	11,318	11,544	11,763	0.7%	0.0%
	Low	.	.	.	.	.	.	.	6,010	8,156	9,191	9,861	10,561	10,777	10,993	-0.1%	-2.3%
Annual Growth	High	.	.	.	.	.	.	.	28%	62%	12%	4%	2%	3%	2%	1.9%	1.7%
	Base	1.7%	1.6%	2.8%	4.0%	3.8%	0.8%	-55%	25%	57%	8%	5%	2%	2%	2%	0.7%	0.0%
	Low	.	.	.	.	.	.	.	21%	36%	13%	7%	7%	2%	2%	-0.1%	-2.3%

* ECAC is the European Civil Aviation Conference
** Leap year

Source: EUROCONTROL, 7-year Forecast October 2021

EUROCONTROL STATFOR 7-year forecast for *Europe 2021-2027

Actual and future total en-route service units, % traffic compared to 2019



* Europe = CRCO Members (39 States)
Source: EUROCONTROL, 7-year Forecast October 2021

Service Unit Forecast

Summary of total service units forecast

Total Service Units (thousands)		2014	2015	2016	2017	2018	2019	2020***	2021	2022	2023	2024***	2025	2026	2027	AAGR 2020-2027 (vs 2019)	AAGR RP3 2020-2024
CRCO States *	High	.	.	.	.	.	167,000	70,828	91,717	157,368	183,066	191,069	196,721	203,296	208,463	2.8%	2.7%
	Base	132,920	138,505	144,274	153,194	162,512	167,000	70,828	88,520	144,985	162,006	171,762	175,863	180,308	184,633	1.3%	0.6%
	Low	.	.	.	.	.	167,000	70,828	82,982	111,115	130,642	143,320	157,669	163,443	167,763	0.1%	-3.0%
RP2 Region **	High	.	.	.	.	.	137,800	57,694	73,995	131,563	151,638	158,581	163,012	168,119	171,956	2.8%	2.8%
	Base	111,670	115,063	120,208	126,928	134,016	137,800	57,694	71,371	121,449	133,945	142,144	145,316	148,716	151,967	1.2%	0.6%
	Low	.	.	.	.	.	137,800	57,694	66,829	92,495	107,865	117,930	129,712	134,063	137,297	0.0%	-3.1%
Annual Growth (compared to previous year)		**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020*** **	**2021**	**2022**	**2023**	**2024*** **	**2025**	**2026**	**2027**	**AAGR 2020-2027 (vs 2019)**	**AAGR RP3 2020-2024**
CRCO States *	High	.	.	.	.	.	.	.	30%	72%	16%	4.4%	3.0%	3.3%	2.5%	2.8%	2.7%
	Base	5.8%	4.2%	4.2%	6.2%	6.1%	2.8%	-58%	25%	64%	12%	6.0%	2.4%	2.5%	2.4%	1.3%	0.6%
	Low	.	.	.	.	.	.	.	17%	34%	18%	9.7%	10.0%	3.7%	2.6%	0.1%	-3.0%
RP2 Region **	High	.	.	.	.	.	.	.	28%	78%	15%	4.6%	2.8%	3.1%	2.3%	2.8%	2.8%
	Base	4.4%	3.0%	4.5%	5.6%	5.6%	2.8%	-58%	24%	70%	10%	6.1%	2.2%	2.3%	2.2%	1.2%	0.6%
	Low	.	.	.	.	.	.	.	16%	38%	17%	9.3%	10.0%	3.4%	2.4%	0.0%	-3.1%

* CRCO States refers to the EUROCONTROL Member States currently participating to the Multilateral Route Charges System.

** RP2 Region stands for the sum over all the 30 States that are involved in the EU-wide performance target setting for the second period, namely: 27 EU Member States plus Norway plus Switzerland plus UK.

*** Leap year

Source: EUROCONTROL, 7-year Forecast October 2021

Additional Risks

The **economic recovery** remains fragile. Current forecast includes different economic forecasts (High: Consumer Boom, Base: Baseline, Low: Return of inflation) but a further deterioration of the economic situation (eg financial crisis) is a downside risk.

The **volatility in oil and fuel prices**: A surge in oil prices could lead in an increase of fuel cost, hence an increase of the ticket prices which is a downside risk.

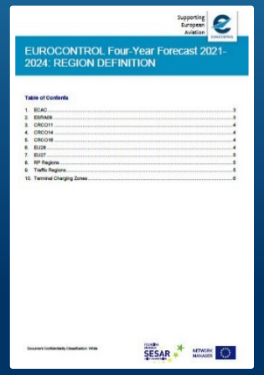
Future **airspace and network changes** (e.g. unexpected closures, new routes) and **airlines' changing choice of routes** are not modelled by the forecast.*

The risk behind **Brexit**: We have assumed that continued transport connectivity will be ensured. Businesses and individuals operating in the UK should therefore see no change to existing conditions after the transition period.

Terrorist attacks, **bans of one country on another one**, **wars and natural disasters**. These are impossible to predict. Their impact on air traffic could however be a temporary one, or more significant.

* Overflights are calculated from routes used over the Sep19 to Aug21 period; this is more significant for individual countries than for all ECAC.

Useful links

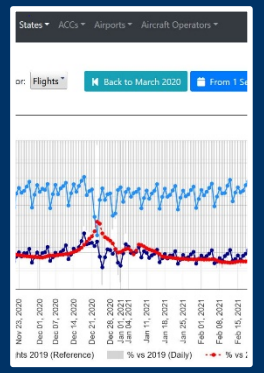


A presentation of the geographical definitions can be found in

Annex - Traffic Region Definitions

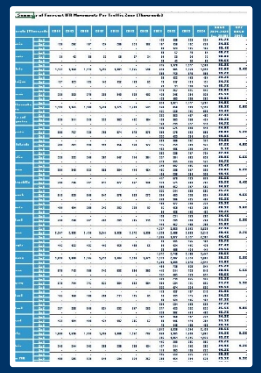
Connect to the

STATFOR Interactive Dashboard



Connect to the

Aviation Intelligence Dashboard



The forecast per state can be found in

Annex - Detailed Traffic Forecast

For further info, please contact the forecasting team statfor.info@eurocontrol.int

SUPPORTING EUROPEAN AVIATION

October 2021 - Issue #4

AVIATION SUSTAINABILITY BRIEFING

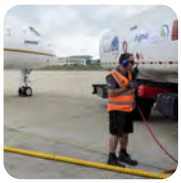
News and views on how we can make aviation sustainable together

EUROCONTROL

The EU's Fit for 55 Package: What does it mean for aviation?

With the "Fit for 55" package the European Union has unfurled its plans to reduce emissions by at least 55% by 2030. In this edition, we look at what this could mean for European aviation.

*Read more on **page 3***



Business aviation: A test bed for sustainability innovations

*Read more on **page 6***

Greening European ATM's ground infrastructure: What could ANSPs achieve over the next decade?

*Read more on **page 9***

Adapting to climate change in Europe

*Read more on **page 11***

EUROCONTROL's work on sustainability

*Read more on **page 13***

Aviation sustainability developments from around the world

*Read more on **page 16***

Editor's note

Marylin **Bastin**
Head of Aviation Sustainability
EUROCONTROL

Contact:
sustainability-briefing@eurocontrol.int

"**Switching to renewable energy and making energy efficient investments** could save air navigation service providers over 311k tonnes of CO_2 every year."

EUROCONTROL Think Paper
"Greening European ATM's ground infrastructure"

The publication of the European Commission's "Fit for 55" package aiming to reduce carbon emissions by 55% by 2030 has given new impulse to the debate on aviation decarbonisation. The revision of the EU Emission Trading System or the proposal to tax kerosene and consequently increase carbon pricing did not come as a surprise, as European Union leaders need to deliver on their commitment to climate neutrality by 2050.

A higher price tag, at least in the short to medium term, is equally expected as a consequence of the **ReFuelEU Aviation proposal**. However, the mandate proposed by the Commission for sustainable aviation fuels (SAF), also including synthetic fuels, gives the aviation and energy sectors a policy framework for accelerating the uptake of SAF. In my view, this is why the proposal is so convincing: while it demands investment from the aviation sector, it also **gives the necessary incentives to boost decarbonisation**.

In this 4th edition of EUROCONTROL's Aviation Sustainability Briefing we provide our readers with a brief overview on what "Fit for 55" could mean for European aviation, and I am especially grateful to **Flor Diaz Pulido, Head of Aviation Policy at the European Commission**, who took the time to discuss the RefuelEU Aviation proposal with us during our recent Stakeholder Forum.

Our search for answers on how to make aviation sustainable continues in our day-to-day work and in especially in our collaboration with our partners. I am delighted that my colleagues **Jarlath Molloy (NATS)**, **Francine Carron (skeyes)** and **Davide Tassoni (ENAV)** have shared their views on EUROCONTROL's Think Paper on decarbonising Europe's air traffic management (ATM) ground infrastructure in this edition. With an estimated 6.2+ million tonnes of CO_2 emissions savings possible by 2050, this is an area of significant potential for decarbonisation.

Our last Climate Change Risk Study for European Aviation has also been published as announced by our Director General in our previous edition. I would like to thank **Denise Pronk (Royal Schiphol Group)**, **Olav Mosvold Larsen (Avinor)** and **Juliana Scavuzzi (ACI World)** for sharing their views and experience on the resilience of the aviation sector.

Last but not least, thank you to **Athar Husain Khan (EBAA)** and **Kyle Martin (GAMA)** for their contribution to our article on business/general aviation. This part of the aviation sector is already playing a significant role in facilitating aviation decarbonisation thanks to their commitment to SAF usage, and the innovative aviation technology already deployed on many of their flights.

I hope you will enjoy reading this edition.
I look forward to any feedback you may have!

The EU's "Fit for 55" Package: what does it mean for aviation?

@ European Commission, 2021

Frans Timmermans, Adina Vălean, European Commission President Ursula von der Leyen, Paolo Gentiloni, Kadri Simpson, Virginijus Sinkevičius (left to right)

With the "Fit for 55" package the European Union has unfurled its plans to reduce emissions by at least 55% by 2030 with the ultimate aim for Europe to become the world's first climate neutral continent by 2050. While the proposals will affect a range of sectors such as construction, energy and transport, we have been looking at the potential changes most relevant for aviation: 1) the revision of the EU Greenhouse Gas Emissions Trading System - a carbon market-based measure, 2) the ReFuelEU Aviation proposal – a mandate accelerating the uptake of sustainable fuels, and 3) the revision of the Energy Taxation Directive introducing a tax on fuel for business and leisure flights.

A stronger EU Emissions Trading System to accelerate transition

The revision of the EU ETS mechanism foresees a progressive phase-out of the free allowances distributed to aircraft operators from 2024 to 2026 (by respectively: 25%, 50% and 75%) and a complete phase-out from 2027 onwards. To meet the more stringent 2030 emission target, the Commission proposes to reduce the emissions cap by 4.2% annually, instead of the current 2.2% and encourages Member States to use the auctioning revenues for tackling climate change more strongly. In terms of scope, the EU ETS would continue to apply to intra-EEA flights as well as flights to the UK and Switzerland, exempting those flights from CORSIA offsetting requirements. For other international flights, EU airlines would be obliged to apply CORSIA.

Boosting sustainable aviation fuels: the ReFuelEU Aviation proposal

The ReFuelEU Aviation proposal is a clear signal to both the aviation and the energy sector, that EU policy-makers take the increased uptake of sustainable aviation fuels by 2050 seriously. In one of EUROCONTROL recent sustainability stakeholder fora, **Flor Diaz Pulido, Head of Unit Aviation Policy, Directorate-General Mobility and Transport, European Commission**, said:

Flor Diaz Pulido,
Head of Unit Aviation Policy,
General Mobility & Transport,
European Commission

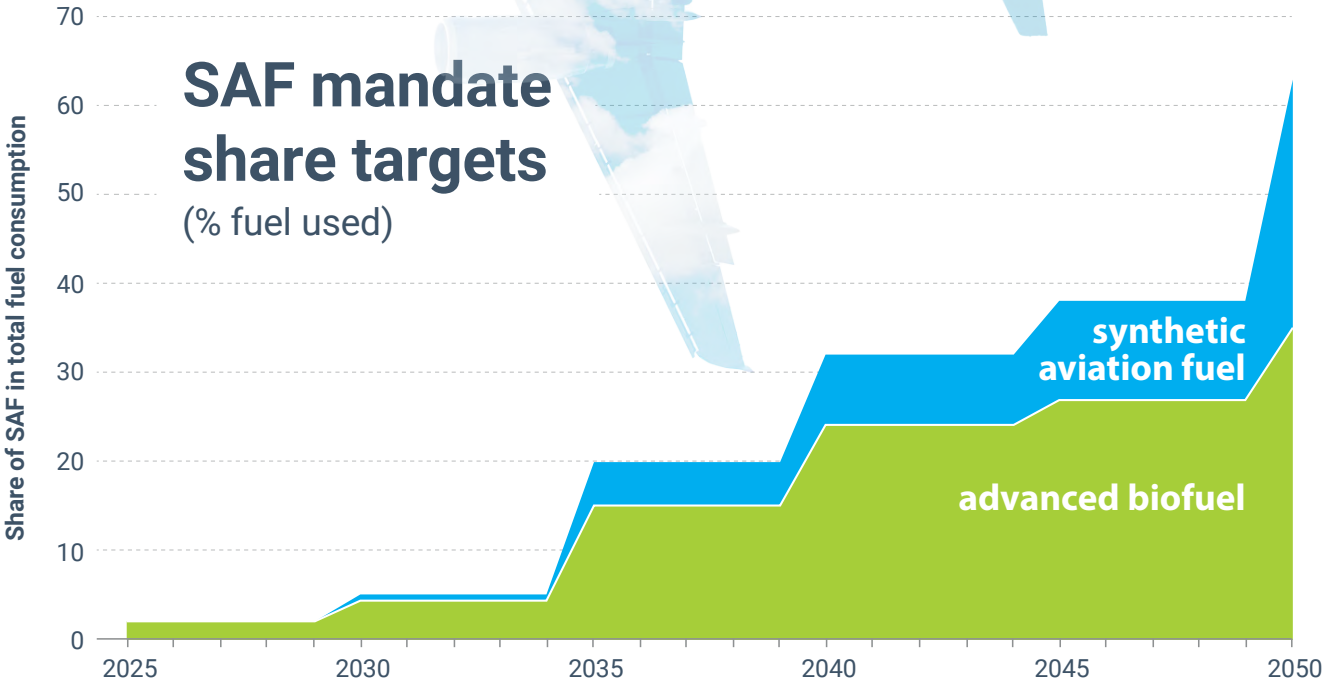
"We have had an economic and a regulatory issue: there is not enough demand because the prices were too high and there is not enough supply because there was not enough demand. Horizontal approaches have not worked until today due to the specificities of the aviation market, highly integrated and in need of a very specific kind of liquid fuels. This is why we have come up now with a sectoral approach, to reach a strong business case for decarbonising aviation and producing SAF."

Looking to ramp up the production, deployment and supply of affordable, high quality sustainable aviation fuels (SAF) in Europe, the ReFuelEU Aviation proposal would require fuel suppliers to blend an increasingly high level of sustainable aviation fuels into existing jet fuel uploaded at EU airports, including a minimum share of synthetic fuel (see chart on SAF share mandates).

There will also be an obligation on all airlines (EU and non-EU) departing from EU airports to uplift the jet fuel necessary to operate the flight prior to departure, to avoid fuel tankering. The proposal targets the cleanest advanced biofuels and novel electro-fuels, which meet the sustainability criteria set in the Renewable Energy Directive. It also calls for Member States to introduce penalties on aviation fuel suppliers and aircraft operators in case of non-compliance. To complement these measures promoting SAF, the European Commission announced it would create a zero emission aviation alliance by the end of 2021 to ensure market readiness for disruptive aircraft configurations (e.g. hydrogen, electric).

The Energy Taxation Directive incentivizes the green transition while preserving the internal market

The proposed changes to the Directive aims at making cleaner fuels more attractive in all transport modes. For aviation, this means the end of all fossil-fuel subsidies and a revision of current tax exemptions for jet fuel on intra-EU flights. Concretely, this means that from 2023, the minimum tax rate for aviation fuel for intra-EU flights would start at zero and increase gradually over a 10-year period, until the full rate of EUR10,75/Gigajoule is imposed. SAF, including renewable hydrogen and advanced biofuels, would not face minimum EU taxes during that 10-year period and cargo-only flights would be exempted.



Source: EUROCONTROL

A holistic approach including also updates to energy infrastructure and Member State involvement

Last but not least, the "Fit for 55" package includes two more measures that would directly affect aviation: new electric infrastructure for airports is planned under an Alternative Fuels Infrastructure Regulation (AFIR) and a new Effort Sharing Regulation target could be set requiring Member States to prepare new national measures on binding annual greenhouse gas emissions reductions.

Funded by the new Emissions Trading System the social climate fund is set to support Members States in mitigating the packages' social implications.

What's next?

The legislative proposals will be scrutinized by the European Parliament and the Council with options for amendments. The full process until final adoption may take between 8 and 18 months.

The Commission has also called on the Council and the European Parliament to agree quickly on the updated Single European Sky regulatory framework, which could help cut aviation emissions by up to 10%.

You can watch our Stakeholder Forum on SAF at
https://www.eurocontrol.int/eurocontrol-stakeholder-forum

Business aviation:
a test bed for sustainability

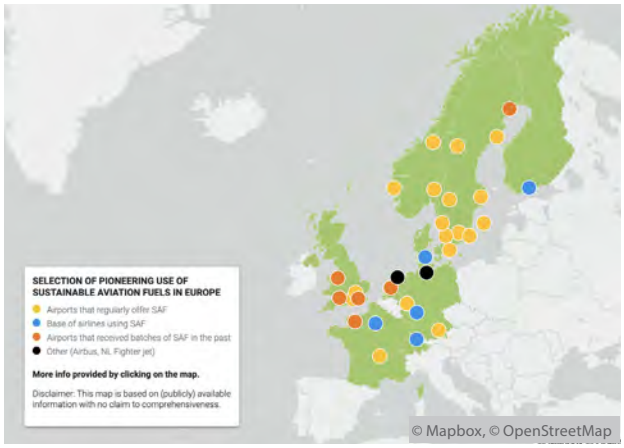
Business aviation manufacturers and operators are in a strong position to decarbonise their flights due to their possibilities of investing in sustainable aviation fuel and latest aircraft technology. It is a fact little known to the public that most environmental innovations are tested by business and general aviation before being scaled up for commercial aviation. In partnership with mid-size airports, business aviation represent a fair part of the European sustainable aviation fuels (SAF) pioneers.

To significantly and quickly lower net lifecycle carbon emissions, SAF is a must

"SAF is a key component, accessible today, to deliver business aviation's decarbonisation programme. To support that element, elevate its importance to the sector and enable early adoption, the sector created the **Business Aviation Coalition for SAF**, which has produced educational material, held events, and worked with key stakeholders to drive forward the increased uptake of SAF."

Athar Husain Khan, Secretary General, European Business Aviation Association (EBAA)

Business aviation operators use SAF in partnership with airports such as Bristol, Biggin Hill, Caen-Carpiquet, or London Luton, as the EUROCONTROL **SAF availability map indicates**. Given the relatively limited availability of SAF, the **Fueling the Future** guide encourages business aviation operators to pursue innovative measures such as 'Book-and-Claim'. Under this programme, they can purchase SAF at an airport where it is unavailable, and receive a credit for its supply and use at an airport where it is available.



Our EUROCONTROL SAF map illustrates which airports in Europe make SAF available to general/business aviation

Ready to adopt ATM-optimised measures for flight efficiency

The business aviation fleet is made up of very modern aircraft, highly manoeuvrable and with the latest avionics. Business jets can climb very fast to their cruising level at high altitudes, therefore freeing airspace for general traffic and reducing the traffic complexity induced by the changes of flight level, especially at peak hours. This optimises trajectories and consequently reduces fuel consumption for both business and commercial aircraft. In the landing phase, thanks to recent avionics – such as satellite EGNOS-based equipment – business jets can perform more precise navigation and more direct trajectories towards an airfield. The EBAA is also advocating further ATM improvements to reduce noise: business jets could easily accommodate increased glideslopes when landing, therefore flying all along the track at a higher altitude, resulting in reduced noise.

"General aviation is the cradle of innovation for aviation."

Most environmental innovations are tested out by business and general aviation before being scaled up for commercial aviation.

"The general aviation manufacturing industry is at the forefront of developing technologies that result in more efficient wing, rotor, fuselage, systems and engine design as well as furthering revolutionary innovations like hybrid, electric, and hydrogen-powered aircraft. These technological advancements, some of which are already flying in Europe today, are progressing our industry's sustainability commitments towards decarbonisation."

Kyle Martin, VP European Affairs, General Aviation Manufacturers Association (GAMA)

Optimal visibility for approaches is an example of innovation serving the environment. The Head Up Display (HUD) combined with an Enhanced Vision System (EVS) makes direct landing possible in all weather conditions. This avoids the unnecessary fuel consumption that results from maintaining extended holding patterns until weather conditions and visibility improve. Winglets illustrate perfectly the pioneering role of business aviation in flight efficiency: the first flight of a commercial aircraft with winglets was performed by a high-speed business jet, the Learjet 28/29, and it took place back in… 1977! Looking further into the future, active winglets – i.e. winglets using load sensors and a camber surface, which automatically control wing bending during turbulence – offer promising perspectives, with efficiency gains up to 33% and unsurpassed climb performance.

Optimal visibility for approaches

Light aviation can already offer 100% electric flights for training today

The first fully electric aircraft to be type-certified in Europe by EASA in July 2020 is the Pipistrel Velis Electro. This battery-powered plane, produced by Pipistrel, a Slovenian company, is a small two-seater, intended for training pilots. It produces few emissions and low noise (<60Db), and is an economically viable solution that can help accelerate the environmentally responsible transition of light aviation in Europe. Big orders like Green Aerolease's decision to purchase 50 Pipistrel Velis Electro, with plans to deploy 200 more within 3 years, show the market appetite for this new direction.

Hydrogen-powered aircraft: an emerging true zero-emission technology

In September 2020, ZeroAvia achieved the world's first hydrogen fuel cell-powered flight of a commercial-grade aircraft. This technology results not only in true zero-emission flights but also in lower fuel and maintenance costs. ZeroAvia is now expanding its Hydrogen-Electric Aviation Program to a 19-seat aircraft, pushing further the limits of this promising technology. Both these projects exemplify the scope for innovation general aviation is capable of, as it continues to lead the way for other aviation sectors.

@ ZeroAvia

GREENING European ATM's ground infrastructure

What could ANSPs achieve over the next decade?

6.2+ million tonnes CO_2 emissions could be saved by 2050 by decarbonising air traffic management (ATM) ground infrastructure, suggests EUROCONTROL's latest Think Paper. As the aviation sector has firmly committed to do its part in the fight against climate change, progressively decarbonising European ATM's ground infrastructure is both realistic and achievable, our paper argues, and could deliver large potential emissions savings in support of aviation's overall decarbonisation goals.

European air navigation service providers (ANSPs) are estimated to consume 1,140 GWh of electricity annually, roughly equivalent to 55% of the annual electricity consumption of Malta. We estimate that switching to renewable energy and making energy-efficient investments could save ANSPs over 311K tonnes of CO_2 every year.

Our Think Paper makes a very first assessment of the extent of ANSP infrastructure, which includes well over 6,000 communications, navigation and surveillance ground-based facilities across Europe, as well as over 400 control towers, over 60 area control centres, and various offices. After modelling the total predicted energy consumption of this infrastructure, we then calculate the CO_2 equivalent (CO_2) emissions that would be produced as a result.

"This Think Paper is a good attempt to fill a significant gap in measuring environmental performance among ANSPs. There are pockets of encouraging activity around Europe, but this shouldn't be the exception. We must all do better at measuring, managing, improving and reporting our environmental performance."

Jarlath Molloy
Senior Environmental Affairs Manager, NATS

Progress has already been made by some ANSPs towards switching to renewable energy contracts, or greening their facilities, which serve as best practice for their peers: UK air navigation provider NATS has purchased renewable electricity for over 96% of total electricity consumed in 2020-2021 (up from 93% in the previous reporting year). This is an example of a portfolio of activities that led to NATS being identified as a European Climate Leader by the Financial Times in 2021 for its environmental performance since 2014.

Italian air navigation service provider ENAV has set itself the goal to become a carbon neutral company by 2022 through a substantial reduction in emissions. Emissions are to be reduced by 23% in 2021, by 80% in 2022 and, again in 2022, the quantity of residual emissions will be offset by purchasing carbon credits or by financing environmental protection projects such as the construction of a hydroelectric power plant in India and the replacement of polluting stoves in some rural settlement in Mozambique. On EUROCONTROL's Think Paper Davide Tassi, ENAV's Head of Sustainability and Corporate Social Responsibility said:

"The Think Paper is a particularly important tool for benchmarking decarbonisation initiatives among the various ANSPs. It also aids collaboration between companies and promotes the development both of increasingly sustainable routes and also of strategies that are based on ethics and transparency – and which actively contribute to the achievement of the Sustainable Development Goals."

enav

Davide Tassi
Head of Sustainability and Corporate Social Responsibility

The Think Paper makes a series of assumptions based on an assessment of the scope of the known or estimated infrastructure – with some caveats based on the nature of the main types of facility. On the communications side, many facilities have to be kept in a specific temperature range to function as guaranteed, requiring air conditioning which adds additional power consumption. Thus, for a communications antenna, its power use is likely to be substantially less than its air conditioning unit. On the other hand, the power consumption of a primary radar station emitting electromagnetic pulses, including all the electronics and rotating elements, will be substantially greater than any air conditioning it may require. For communications equipment in particular, it may be impossible for an ANSP to isolate the power consumption of an antenna if it is located on top of a building operated by a third party.

For navigation and surveillance facilities, their nature as single-purpose installations only developed for and operated by air traffic control should make it easier to calculate individual energy consumption; this information is not however publicly available, since facilities' performance requirements are generally covered in confidential supplier contracts.

Estimating ANSPs' energy consumption therefore requires a different approach. Some ANSPs do publish annual aggregated energy consumption data, and this Think Paper uses this to develop a ballpark figure.

"EUROCONTROL's Think Paper on decarbonising European ATM ground infrastructure paves the way for more sustainable equipment thinking. It clearly demonstrates how, in order to conduct decarbonising activities, all elements that contribute to an increase in an ANSP's environmental footprint must be examined. Rapid decarbonisation is a critical strategic activity for achieving a net-zero future. Actions such as enhancing energy efficiency, renewable energy sources, fuel switching, and other technology should be shared and discussed more widely among ANSPs, and this document currently provides an excellent foundation."

skeyes nice to guide you

Francine Carron
Corporate Social Responsibility Program Manager, skeyes

skeyes, the Belgian ANSP, has used 100% green electricity since 2015, and has approved the installation of a solar farm at its main site adjacent to Brussels airport.

The estimates in this Think Paper are a first attempt to quantify the total potential emissions saving that greening Europe's ATM ground infrastructure could achieve over the course of the next decade, and are designed to stimulate decision-making in the years ahead. Improving the energy efficiency of all ground infrastructure over the next 10 years will be both a challenge, and a window of opportunity if successfully linked to investment cycles.

AVINOR Schiphol Group ACI AIRPORTS COUNCIL INTERNATIONAL

Our resilience depends on the resilience of others

Adapting to climate change risks for aviation

Increased risk of flooding of airports, delays due to more intense major storms and higher costs for airlines and passengers are all significant climate change risks for European aviation that are set to intensify, a recent EUROCONTROL study has concluded. While the aviation sector has acknowledged it needs to decarbonise, it has also become clear that the sector itself will increasingly be threatened by climate change. So what is aviation doing to adapt to climate change?

Our recent EUROCONTROL Stakeholder Forum on climate change adaptation saw Olav Mosvold Larsen from Avinor, Juliana Scavuzzi of ACI World and Denise Pronk of Royal Schiphol Group exchange views on the urgent need for aviation to ramp up its ability to adapt to the impact of climate change.

Norwegian company Avinor, which operates 43 airports and the country's air navigation services, has been working on climate adaption for over 20 years. The main challenges they face are the impacts caused by warmer, wetter and wilder weather. "However, there is a big difference between the northernmost airports and the southernmost airports", Avinor senior expert Olav Mosvold explained. "At Svalbard airport – our northernmost airport – the permafrost is melting and we are facing damage to runways and buildings." On the mainland, where the warmer weather increases the frequency of ice melting and freezing again, this comes with some very particular challenges such as the increased use of deicing chemicals – a financial and environmental burden.

As a consequence of more rain and rivers flooding its airports, Avinor has also noticed more problems with navigational equipment and the need for more appropriate drainage systems to ensure airports remain accessible. The team is undertaking work to improve wave protection and storm defences on low-lying coastal airports and heliports so they can withstand more frequent heavy storms.

"Climate change is affecting aviation actors differently depending on their location in the world. What we are building now is for the future, so be wise"

AVINOR

Olav Mosvold Larsen
Senior Executive Advisor, Avinor

Olav advises, and underlines the importance for airports and other aviation stakeholders to conduct climate change risk assessments – something his own organisation is also currently revising to ensure they are best prepared for climate resilience.

Juliana Scavuzzi of ACI World agreed with Olav on the need for airports to conduct "risk assessments and incorporating actions to ensure business continuity". The ACI World **Policy Brief: Airports' resilience and adaptation to changing climate**, which includes case studies from both Avinor and Schiphol, among others, also recommends developing and incorporating actions based on risk assessments at early stages, and keep the long-term vision, by including resilience and adaptation considerations into airport Master Plans.

"Our resilience depends on the resilience of others."

Juliana Scavuzzi,
Senior Director Sustainability, Environmental Protection and Legal Affairs, ACI World

A survey done by ACI World among their members shows that 40% of respondents have conducted such a risk assessment to better prepare their airports for climate resilience. Given the interdependence of the aviation sector, Juliana reminded the audience that **"our resilience depends on the resilience of others"**, stressing the need for collaboration and support from policy-makers to overcome the lack of harmonisation in climate change adaptation measures among aviation and non-aviation stakeholders.

Amsterdam-Schiphol airport - one of the largest airports in Europe - happens to also be one of the lowest located airports in the world, lying 4.5m below sea level, and serves as a safe haven to its passengers. **"Adverse weather is already disrupting flight operations across the globe"**, explained Denise Pronk, Programme Manager Corporate Responsibility at Royal Schiphol Group, **"therefore investment in climate adaptation is an absolute must for mobility infrastructure to be resilient to future changes."**

A priority for the Group in this endeavour has been to develop a very concrete adaptation measure in the form of an innovative, resilient water drainage system that handles extreme rainwater using state-of-the-art sensors and helps to keep airport operations going. To support national and European mitigation efforts for climate change, Royal Schiphol Group has set ambitious goals to contribute to the net zero carbon emissions 2050 target and to become a resilient airport itself.

"Investment in climate adaptation is an absolute must for mobility infrastructure to be resilient to future changes."

Denise Pronk
Programme Manager Corporate Responsibility ,
Royal Schiphol Group

The panellists' experiences' complements the findings of the recent EUROCONTROL study "Climate Change Risks for European Aviation", which assesses how existing weather trends have impacted aviation in recent years and how climate change impacts might affect the sector in the future. It forecasts growing disruption both on the ground and in the air: airports and their surrounding transport infrastructure face a growing risk of flash flooding and rising sea levels, while flight operations are set to be increasingly delayed by violent storms that will increase delays, raise fuel burn and lead to higher emissions. The study and its detailed annexes are available on EUROCONTROL's website.

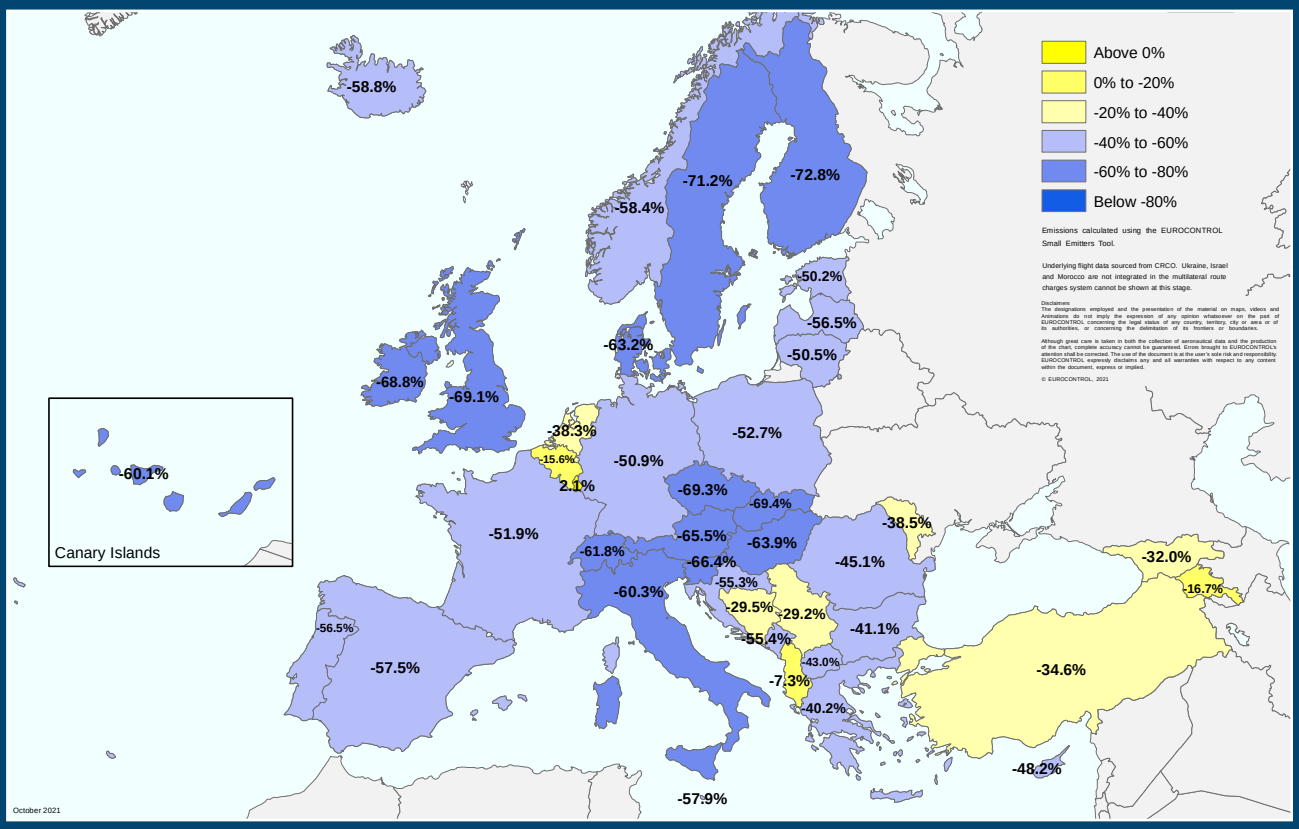
EUROCONTROL

Latest news on EUROCONTROL's **work on sustainability**

EUROCONTROL Data Snapshot: CO_2 emissions from flights so far in 2021 are 54% lower than in 2019, while flights are down by 50%

Following this summer's strong traffic recovery, we have reviewed CO_2 emissions from European flights, comparing the first nine months of 2021 with the same period in 2019. While restrictions on short-haul and long-haul travel continued from 2020 into 2021, these had significantly eased on short-haul intra-European flights by the summer. All CO_2 emissions from a flight are assigned to the country of departure, so here we report just on departing flights: there were 50% fewer departing flights so far this year than in the same period in 2019, in the countries shown on the map.

CO_2 emissions were down a little more than flights: 54% lower than in January-September 2019. The decline in CO_2 is deeper than that of flight departures because medium and long-haul flights, which emit more CO_2, have recovered more slowly than short-haul.



EUROCONTROL Aviation Sustainability Summit

On 22 November 2021 EUROCONTROL will be hosting a high-level Aviation Sustainability Summit bringing together thought-leaders such as Ryanair Group CEO Michael O'Leary, IATA Director General Willie Walsh, Lufthansa CCO Christina Foerster, Henrik Hololei, Director General of DG MOVE, European Commission, Solar Impulse Founder Dr. Bertrand Piccard, easyjet CEO Johan Lundgren, Wizz Air CEO Joszef Varadi, Embraer Commercial Aviation CEO Arjan Meijer, and EASA Executive Director Patrick Ky. You can register for the summit here: https://www.eurocontrol.int/event/eurocontrol-aviation-sustainability-summit

New EUROCONTROL aviation sustainability webpages

EUROCONTROL's web section on aviation sustainability (https://www.eurocontrol.int/aviation-sustainability) has been re-launched illustrating key data products on reducing noise, emissions and climate impacts while continuing to ensure users can immediately find EUROCONTROL's impact assessment tools. Also, by using our new functionality in our map illustrating pioneering use of sustainable aviation fuels stakeholders are now able to share with us information on their SAF initiatives.

EUROCONTROL and Civil Aviation Authority of Singapore starting cooperation on emissions data

EUROCONTROL and Singapore's CAA (CAAS) have started to extend the scope of their cooperation on the area of aviation sustainability exchanging flight data with the objective to monitor carbon emissions in the context of CORISA – ICAO's Carbon Offsetting and Reduction Scheme for International Aviation. EUROCONTROL already provides an Environmental Management Information Service (EMIS) to Aircraft Operators and to European authorities. The exchange with CAAS will enrich the EMIS data set and support CAAS in their monitoring of emissions of operators under their responsibility.

CAAS
Civil Aviation Authority of Singapore

Aviation Sustainability Developments from around the world

IATA approves resolution to achieve net-zero carbon emissions by 2050

The 77th Annual General Meeting of IATA, the International Air Transport Association, approved a resolution for the global air transport industry to achieve net-zero carbon emissions by 2050. This commitment will align with the Paris Agreement goal for global warming not to exceed 1.5°C. The strategy is to abate as much CO_2 as possible via in-sector solutions such as sustainable aviation fuels, new aircraft technology, more efficient operations and infrastructure, and the development of new zero-emissions energy sources such as electric and hydrogen power. Any emissions that cannot be eliminated at source will be eliminated through out-of-sector options such as carbon capture and storage and offsetting schemes.

Lufthansa invests in the first industrially produced carbon-neutral, electricity-based kerosene made in Germany

The world's first industrial plant capable of producing CO_2-neutral electricity-based kerosene was officially opened at the beginning of October 2021 in Werlte/Emsland. It is operated by the climate protection organization atmosfair and produces synthetic fuel for aircraft from water, CO_2 and renewable electricity (power-to-liquid = PtL). The Lufthansa Group is a partner in the pioneering project and also one of its first customers planning to purchase at least 25,000 litres of PtL fuel annually over the next five years and make it available to customers.

Heathrow pushes for SAF mandate

London Heathrow Airport urged the UK government to show leadership by putting policies in place to scale up the production of sustainable aviation fuels in the UK. Heathrow CEO John Holland-Kaye said: "We should aim for 2019 to have been the peak year for fossil fuel use in global aviation. The UK Government can show real leadership in decarbonising aviation at COP26, by setting a progressively increasing mandate and a plan to use contracts for difference to accelerate the transition to Sustainable Aviation Fuel in the UK, which will protect the benefits of flying for future generations."

Airbus, Air Liquide and VINCI Airports announce partnership to promote the use of hydrogen and accelerate the decarbonisation of the aviation sector

Airbus, Air Liquide and VINCI Airports are working together to promote the use of hydrogen at airports and build the European airport network to accommodate future hydrogen aircrafts. Lyon-Saint Exupéry Airport (VINCI Airports' centre of excellence for innovation) has been chosen as the pilot airport by the partners deploying a hydrogen gas distribution station from 2023 onwards. The station will supply both the airport's ground vehicles (airside buses, trucks, handling equipment, etc.) and those of its partners, as well as the heavy goods vehicles that drive around the airport. This first phase is essential to test the airport's facilities and dynamics as a "hydrogen hub" in its area of reach. Between 2023 and 2030: deployment of liquid hydrogen infrastructures that will allow hydrogen to be provisioned into the tanks of future aircraft.

Business Aviation Pledges
Net-Zero Carbon Emissions By 2050

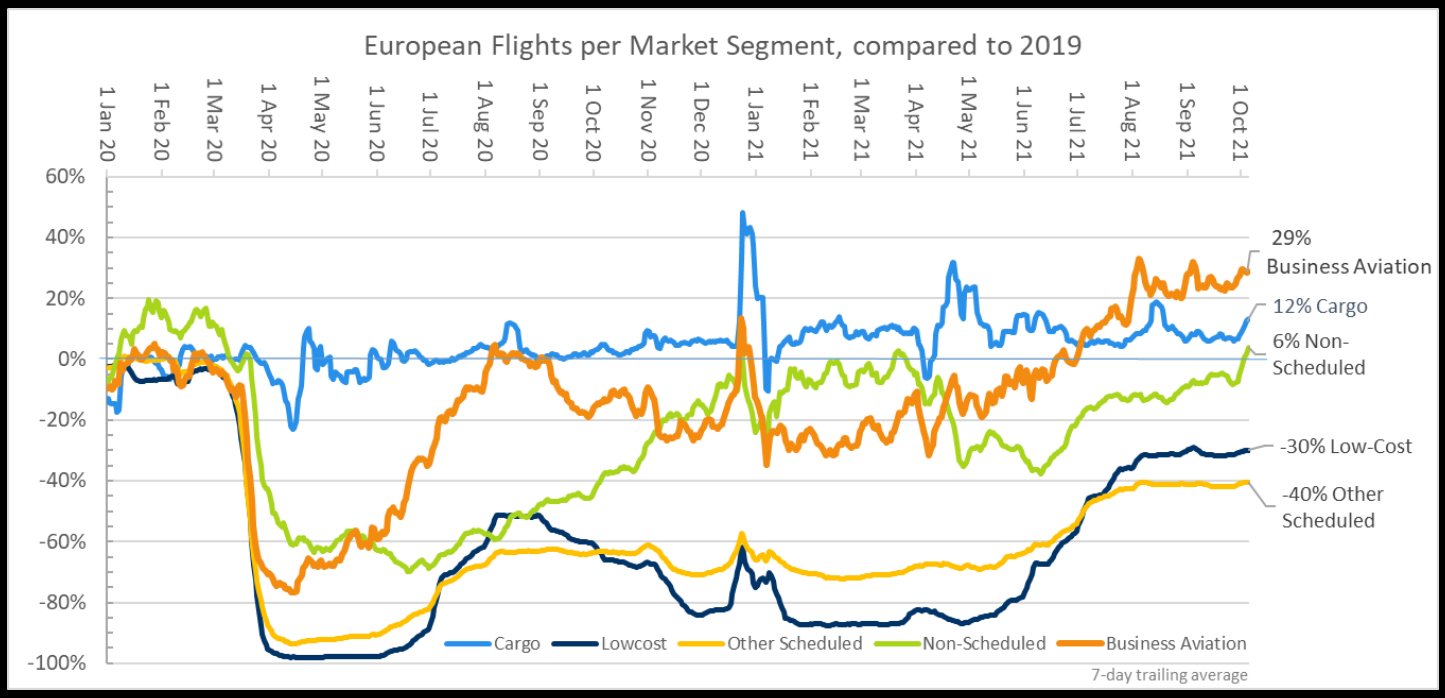
The International Business Aviation Council (IBAC) and its 15 member associations from around the world have agreed to the ambitious goal of net-zero carbon emissions by 2050. The global business aviation community pledges to further contribute to climate action efforts through a combination of measures in close collaboration with governments and stakeholders across the air transport industry. The actions identified in the Business Aviation Commitment on Climate Change in 2009 - modern technology, sustainable aviation fuel (SAF); operational improvements and modernized infrastructure; and market-based measures (MBMs)- must be even more aggressive to reach the new net-zero goal. The industry will need a substantial shift in aircraft innovation; a transition to sustainable energy sources, including a significant increase of sustainable aviation fuel (SAF) production and use; a modernized and efficient operational infrastructure; and acknowledgment that offsets will most likely be necessary to meet the goal by 2050.

SUPPORTING EUROPEAN AVIATION

EUROCONTROL Data Snapshot

Business aviation in Europe is holding onto its 'best recovery from COVID-19' trophy, for now.

19 October 2021



Since the start of the COVID-19 pandemic, just two segments of European aviation have managed an extended period back at 2019 levels of traffic: all-cargo and business aviation. Business aviation briefly matched 2019 volumes in summer 2020. The graph shows that this segment's recovery then restarted in April 2021, passing 2019 levels in July and stabilising at 20%-30% above 2019 since August (2,728 average daily flights in Aug-Sep compared to 2,182 in 2019). As a result, its market share has climbed from around 6% in 2019 (Jan-Sep), to 13% in 2021 so far.

Growth as strong as this comes from changes in both supply and demand: operators finding new ways to reach customers, and new services to offer, such as shared flights; plus new passengers turning to business aviation flights, because the connectivity they want isn't currently available with the timing or quality that they want.

Already this year's recovery for business aviation is more sustained than last year's. In summer, the focus of business aviation switches to Mediterranean, leisure destinations: Nice-Côte d'Azur airport often takes the top spot from Paris Le Bourget in July and August. This year was no exception to that rule, but Ibiza, Palma de Mallorca, Athens and Malaga were also all higher in the rankings than in a normal summer, with Palma, Athens and Malaga more than 40% above 2019 flights in August. So leisure has clearly contributed strongly to the growth of business aviation.

Early signs in September suggest that the growth will continue, but soften from its current 20%+ over 2019. Traffic at Olbia in Sardinia, which can be ahead of Le Bourget in the rankings in August, has declined less than normal in September, with strong growth over 2019 that still contributes to the 29% overall. Palma and Malaga are similar. So leisure continues to contribute.

However, growth at major airports away from the Mediterranean - Le Bourget, Geneva, Farnborough, Moscow, Luton – is in single figures in September, or even lower than 2019. As these increasingly make up a larger share of flights as autumn progresses, overall growth is likely to weaken. There are strong points – Zurich, Istanbul Ataturk, Berlin – which might help to sustain the current growth into the Autumn. Meanwhile, routes out of Europe crept above 2019 in July and August, boosted by flights from Moscow, but are back below 2019 in September. The expected re-opening of flights across the North Atlantic should help keep to keep business aviation in growth.

Technical Bits: Regular updates of data on 'business aviation', and the full definition, are available in the STATFOR dashboard. All growth is against 2019 flights.

Supporting
European
Aviation

EUROCONTROL

EUROCONTROL Seven-Year Forecast 2021-2027: REGION DEFINITION

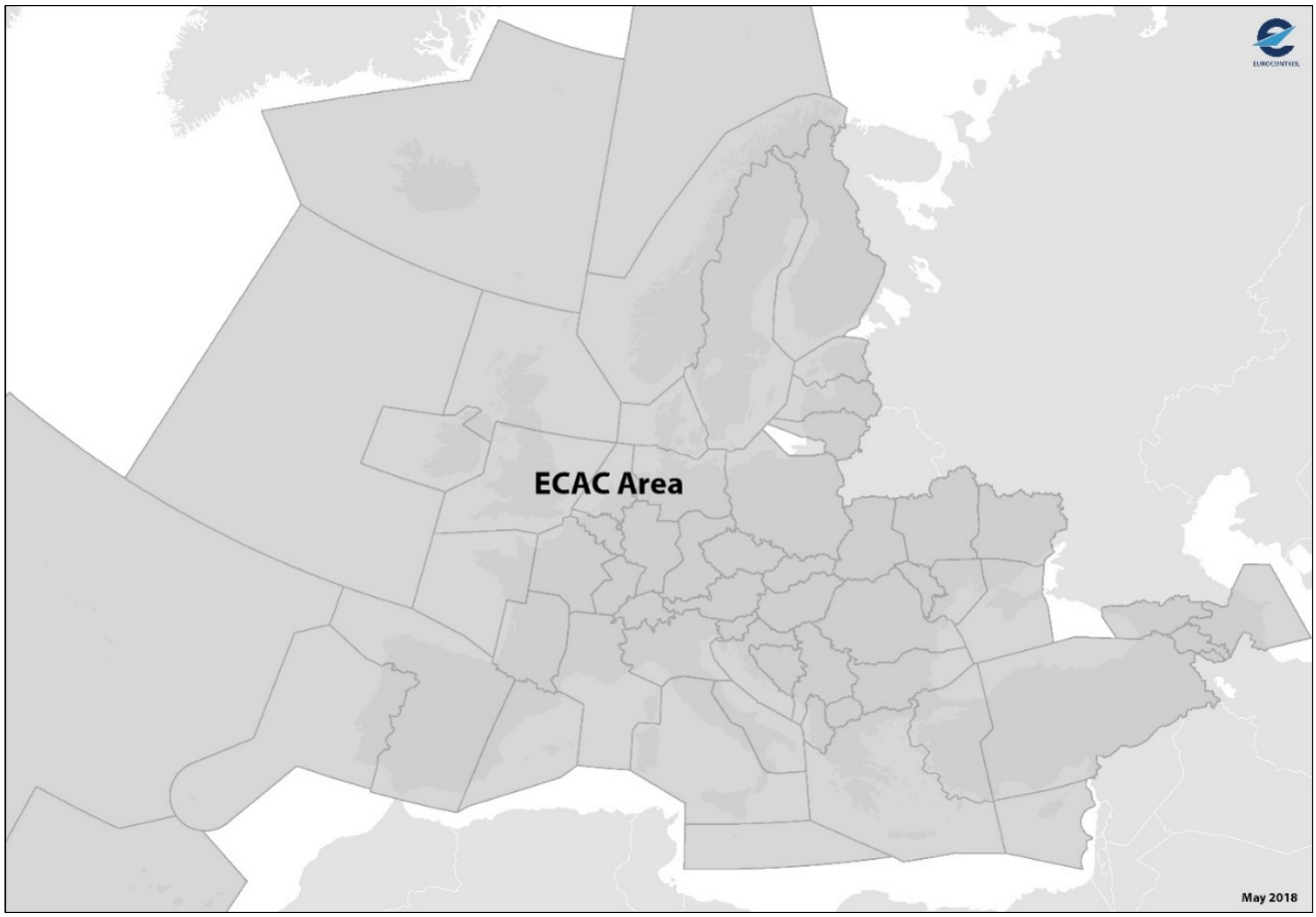
Table of Contents

1. ECAC

The European Civil Aviation Conference (ECAC) is an intergovernmental organization which was established by ICAO and the Council of Europe. ECAC now totals 44 members, including all 27 EU, 31 of the 32 European Aviation Safety Agency member states, and all 41 EUROCONTROL member states.

It is now used as a basis for comparison at European level in the forecasts. The regions is subdivided into sub-regions to better analyse the traffic flows between Europe, see Section 9.

Figure 1. Map of the Flight Information Regions of the European Civil Aviation Conference (ECAC) Area.



2. ESRA08

The EUROCONTROL Statistical Reference Area (ESRA) is designed to include as much as possible of the ECAC area for which data are available from a range of sources within the Agency 'ESRA08' was introduced in the MTF09 report. It was used as a basis for comparison at European level in the forecasts up to September 2015.

ESRA08 consists of 34 traffic zones. Traffic zones are defined by an aggregate of FIRs & UIR of States. These do not take delegation of airspace into account. For individual States, the differences between charging areas and ACCs can have a big impact on overflight counts (and thus on total counts where the total is dominated by overflights). For the ESRA as a whole, there is only a small proportion of overflights, so that the difference between a FIR and an ACC definition is small.

Figure 2. The EUROCONTROL Statistical Reference Area.

3. CRCO11

'CRCO11' refers to the sum of all the charging zones formed by the EUROCONTROL Member States participating in the Multilateral Route Charges System in 2012. This list comprises: Albania, Armenia, Austria, Belgium/Luxembourg (one single charging zone), Bosnia-Herzegovina, Bulgaria, Canary Islands, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lisbon FIR, Lithuania, Malta, Moldova, Netherlands, North Macedonia, Norway, Poland, Romania, Santa Maria FIR, Serbia-Montenegro (one single charging zone), Slovakia, Slovenia, Spain (Spain continental only), Sweden, Switzerland, Turkey, UK.

4. CRCO14

'CRCO14' refers to the sum of all the charging zones formed by the EUROCONTROL Member States participating in the Multilateral Route Charges System in 2014. This list comprises: CRCO11 and Georgia, which joined EUROCONTROL in 2014.

5. CRCO16

'CRCO16' refers to the sum of all the charging zones formed by the EUROCONTROL Member States participating in the Multilateral Route Charges System in 2016. This list comprises: CRCO14 and Estonia, which joined EUROCONTROL in 2015.

6. EU28

This forecast report includes EU28, taking the accession of Croatia into account. The traffic counts exclude Canaries and Azores. This region is then valid from 2014 to 2020.

7. EU27

This forecast report includes EU27, as a result of the United Kingdom leaving the European Union (EU28) from 2020. Corresponding EU27 historical data have been calculated for year 2019.

To avoid confusion with the code used for the composition of the EU between 2007 and 2013 (with UK, before accession of Croatia), the former EU27 aggregate has been renamed EU27_2013 but is not presented in this report.

8. RP REGIONS

RP1Region is the region involved in the Performance Scheme related to the First Reference Period (2012-2014). RP2Region is the region involved in the Performance Scheme related to the Second Reference Period (2015-2019). And RP3Region is the region involved in the Performance Scheme related to the Third Reference Period (2020-2024).

- **RP1Region**: stands for the sum over all the 29 States that were involved in the EU-wide performance target setting for the first period, namely: 28 EU Member States plus Norway plus Switzerland minus Croatia.
- **RP2Region**: stands for the sum over all the 30 States that are involved in the EU-wide performance target setting for the second period, namely: 28 EU Member States plus Norway plus Switzerland.
- **RP3Region**: stands for the sum over all the 29 States that are involved in the EU-wide performance target setting for the third period, namely: 27 EU Member States plus Norway plus Switzerland.

9. TRAFFIC REGIONS

The traffic regions are defined for statistical convenience and do not reflect an official position of the EUROCONTROL Agency. As far as possible, these regions have been aligned with ICAO statistical and forecast regions. Traffic flows are described as being to or from one of a number of traffic regions listed in Figure 3. Each traffic region is made up of a number of traffic zones (=States), which are indicated by the first letters of the ICAO location codes for brevity.

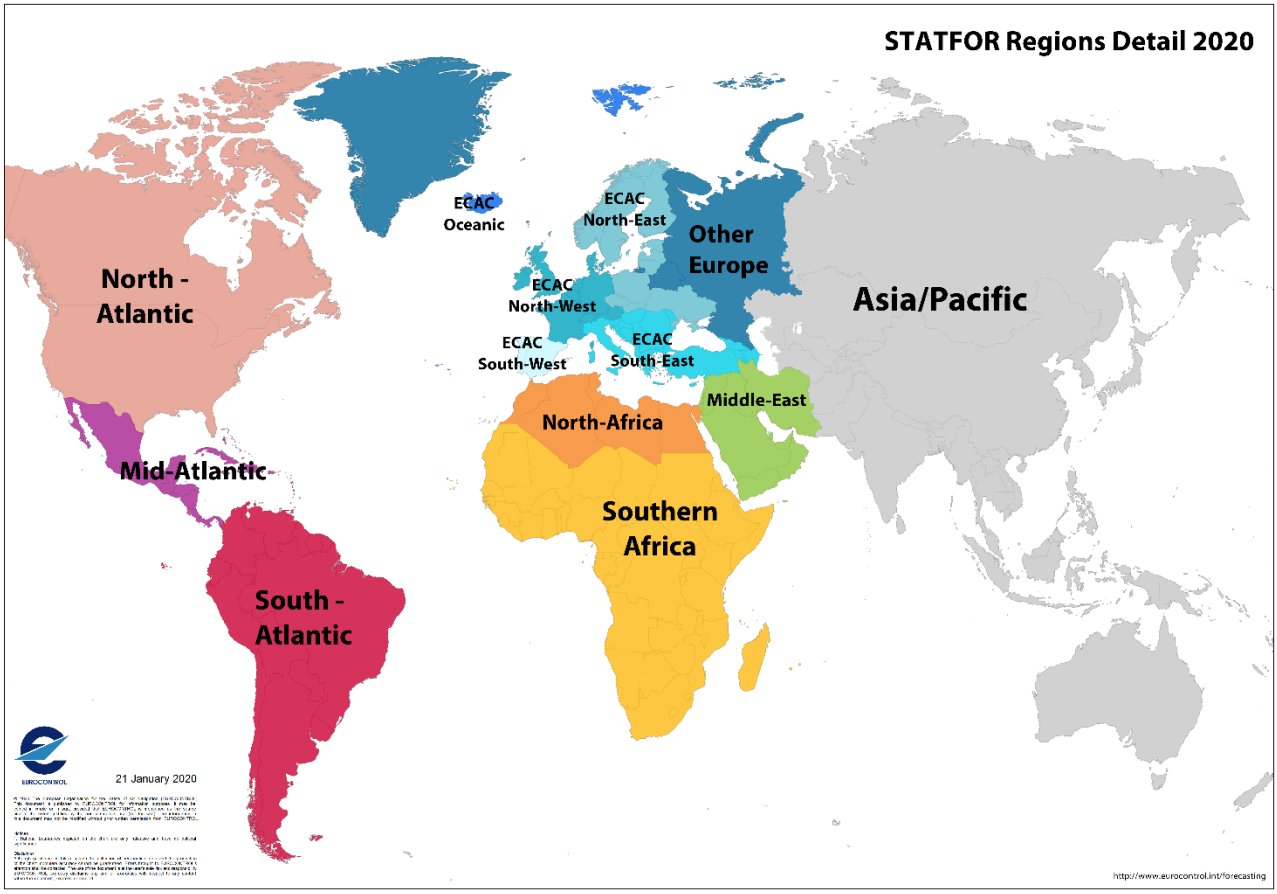
As far as “Europe” is concerned, the zone is split into two regions: ECAC (defined in one of the previous section) and Other Europe. For flow purposes, ECAC is split into five sub-regions “ECAC North-West”, “ECAC North-East”, “ECAC South-West”, “ECAC South-East” and “ECAC Oceanic”. The ECAC sub-regions are shown in Figure 4.

Figure 3. Regions used in flow statistics as of 1st January 2020.

	ICAO region/country
ECAC North-West	EB, ED/ET, EG, EH, EI, EK, EL, LF, LN, LO, LS
ECAC South-West	GC, GE, LE, LP, LX
ECAC North-East	EE, EF, EN, EP, ES, EV, EY, LK, LZ, UK
ECAC South-East	BK, LA, LB, LC, LD, LG, LH, LI, LJ, LM, LQ, LR, LT, LU, LW, LY, UB, UD, UG
ECAC Oceanic	BI, EG (Shanwick Oc), EK (Faroe Islands), ENOB (Bodo Oceanic), LP (Santa Maria FIR)
Other Europe	BG, U * (except UA, UB, UC, UD, UG, UT, and UK)
North Atlantic	C, K, P
Mid-Atlantic	M, T
South-Atlantic	S
North-Africa	DA, DT, GM, HE, HL
Southern Africa	D, F, G, H, (except DA, DT, HE, HL, GC, GE, GM)
Middle-East	LL, LV, O (except OA, OP)
Asia/Pacific	A, N, P, Y, OA, OP, R, V, W, Z (except ZZZZ), U (except UK and areas in Other Europe)

The map of the nine traffic regions used in our statistics is displayed in Figure 4.

Figure 4. Map of the Traffic Regions used in flow statistics.

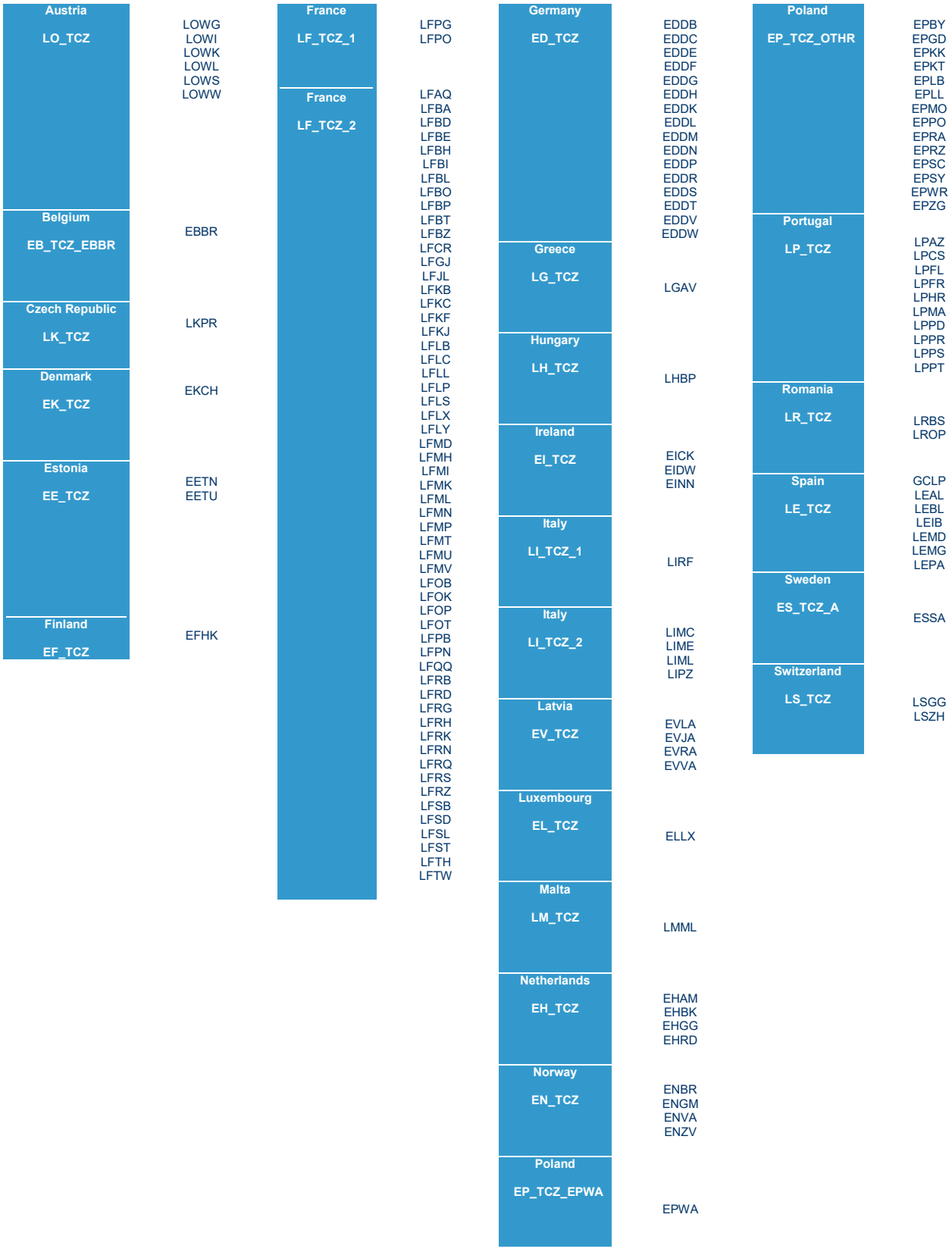


10. TERMINAL CHARGING ZONES

A ‘terminal charging zone’ is an airport or a group of airports for which a cost-based unit rate is established. For the third reference period of the performance scheme (RP3), the list of TCZ has been reviewed. States only have to report their TNSU for airports with traffic of 80,000 IFR movements or more per year (average over 2016-2018). Consequently, Bulgaria, Cyprus, Croatia, Lithuania, Slovenia, Slovakia and some airports in Belgium no longer have a TCZ whose TNSU are to be reported in RP3. Nevertheless, States may have decided to apply the provisions of performance and charging schemes also to terminal air navigation services provided at airports with less traffic than above.

The list of airports in each TCZ and the TCZ that will still be reported in RP3 can be found in Figure 5.

Figure 5. List of aerodromes forming the TCZ in RP3.



Central Route Charges Office
Think Paper #14 - 21 October 2021

EUROCONTROL Think Papers – designed to inform, stimulate debate & present alternative approaches

EUROCONTROL

The funding of air navigation services:
After 50 years, is the joint pan-European system of route charges still fit for purpose?

Safe and efficient aviation operations are nowadays taken for granted when flying. When you sit on an aircraft, you may worry about missing a connecting flight - but almost certainly not about whether air traffic control will be available to guide your flight safely through the airspace. This is due to the undertaking of States to provide air navigation services and facilities. But how do we ensure that these are properly funded, and who bears the costs of these services?

In the late 1960s, the overarching goal was to have airlines paying for the services they receive. At the time, flying was not, as it is today, a commodity; moreover, it was typically associated with something for the 'happy few'. Therefore, it appeared logical to ultimately (via the ticket price) have the clients of the airlines pay for services rendered through the payment of charges.

The EUROCONTROL Member States, acknowledging the benefits of cooperation in respect of the establishment and collection of such charges for en route air navigation services and facilities, agreed to adopt a common policy and entrusted EUROCONTROL with the billing and collection thereof, through its Central Route Charges Office (CRCO). This joint system, referred to as the Route Charges System, has been ensuring since its implementation in 1971 the continuous funding of en route air navigation services, supporting the development of ATM infrastructure which has allowed the exponential growth of air transport.

As the Route Charges System turns 50 this November, weathering half a century of developments at the institutional, operational and regulatory levels as well as a number of crises, it seems opportune to look **whether it is fit for the future for an aviation industry that has recognised the need to go green and is recovering from the COVID crisis - and in particular the pressure this crisis has placed on the Route Charges System.**

This Think Paper looks at the Route Charges System, its origins and key features, and then focuses on challenges for the future, not only for the Route Charges System but as well for the funding of air navigation charges, looking in particular for answers to the following questions:

- Does the common policy governing the Route Charges System still offer a reliable and transparent funding of air navigation infrastructure and services to ensure uninterrupted and safe air transport?
- Should the funding of air navigation services continue to be borne by passengers only, or should taxpayers also have a role?
- Are charges a tool to trigger an optimal use of scarce resources?
- Should charges be deployed to support environmental targets?

MAIN FINDINGS

- For 50 years, the Route Charges System has shown its flexibility to successfully adapt to an evolving air navigation services landscape.
- Efforts should continue to focus on cost-effective provision of air navigation services – **pre-pandemic, actual and nominal costs remained steady for 11 years prior to the pandemic in a period when traffic has risen by 30%.**
- The prolonged COVID pandemic has **triggered questions about the user pays principle,** in particular in view of the overall role in aviation in a crisis as deep as this one. If in 2020 airlines flew around 50% of their expected flights, they could through the spreading of unpaid 2020 costs end up paying for close to 100% of their planned flights.
- When traffic returns, the European network will also once again be **confronted with the pre-pandemic challenges of capacity and delays and environmental considerations.** Charging policies that can help tackle these challenges should be considered when possible.
- The main challenge for the Route Charges System is to keep a common policy while evolving and accommodating traffic, capacity and environmental challenges.
- Single European Sky options such as a **single unit rate** and/or **modulation of charges** should be considered.

The origins of the EUROCONTROL Route Charges System

The first ICAO Conference held in 1958 on "Route Facilities Charges in International Air Transportation" concluded that user charges would be inevitable. European States led the way at the 1967 ICAO Conference on "Charges for Airport and Route Air Navigation Facilities", proposing that charging systems should be based on flight distance and aircraft weight.

With this approach validated, seven Member States signed bilateral agreements with EUROCONTROL and the EUROCONTROL multilateral route charges system was effectively set up, beginning operations in 1971. These arrangements were formalised with the signature of a Multilateral Agreement relating to Route Charges in 1981, at the same time as the amendment of the EUROCONTROL Convention. The Multilateral Agreement entered into effect on 1 January 1986 for ten Member States; today the 41 Member States of EUROCONTROL are all Contracting States to the Multilateral Agreement. [1]

Europe thereby became the **first region in the world to have a joint, simple and cost-effective system for route charges.** A system which has evolved and endured as a result of the close cooperation between the CRCO and States, air navigation service providers (ANSPs) and airspace users' representatives.

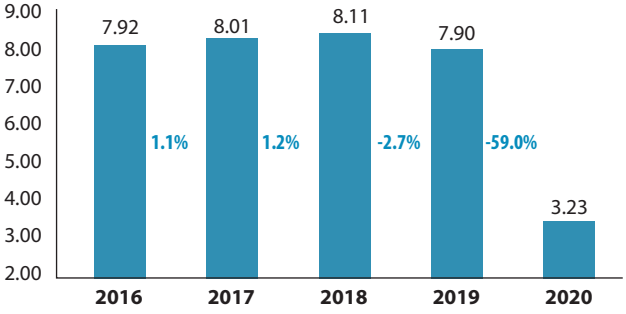
Understanding the fundamentals of the Route Charges System

The foundation of the Route Charges System lies in the decision of the States to adopt a common policy with respect to route charges with two key features. First, with respect to the establishment of the charges, which, in accordance with ICAO Policies, are based on principles of cost-relatedness, transparency and non-discrimination.

Second, through the joint billing and collection of charges. Whether airlines overfly one or ten States, make 50 or 10,000 flights per month, they will receive one bill per month covering the charges for the en route air navigation services they have received in the airspace of the EUROCONTROL Member States.[2]

Based on a formula which takes into account the weight of the aircraft, the length of the flight and the local unit rate (based on the costs of providing the services), the route charges billed by EUROCONTROL to the airlines represented around EUR 8 billion per year for the period 2016-2019[3], before dropping dramatically as traffic collapsed in 2020, as Figure 1 shows.

FIGURE 1: ROUTE CHARGES BILLED, 2016-2020, IN BILLION EURO, & YEAR-ON-YEAR % CHANGE



Supported by enforcement measures made available by States and ANSPs, including detention of aircraft and the denial of air navigation services (ANS) at the request of EUROCONTROL, the **average long-term recovery rate for the route charges billed for the period 2016-2020 amounts to 99.7%.**

The essential role of the Route Charges System in ensuring the continuous funding of services has been recognised throughout the years. **The effectiveness of the system is key, as the route charges billed represent around 96% of the revenues required for ANSPs[4] to cover the cost of providing en route air navigation services.**

An evolving system

The Route Charges System has demonstrated its reliability and capacity to adapt to regulatory and technical changes since its establishment in 1971. This includes moving throughout the years from dollars to ECU to euro, as well as some more fundamental changes.

Initially based on the historical costs of service provision, costs used for charging moved to forecast cost in 1983, introducing the notion of under and over recovery of costs. Further to the establishment of the Single European Sky in 2004, with its increased emphasis on transparency and economic regulation, the determined costs method was introduced and made available to all EUROCONTROL States, in addition to the existing full cost recovery method.

"Europe became the first region in the world to have a joint, simple and cost-effective system for route charges that has demonstrated its reliability and capacity to adapt to regulatory and technical changes since its establishment"

Throughout the years, the availability of data also made possible changes to key elements of billing such as flight distance. The calculation of the distance accordingly evolved from the 'most frequently used route' to the 'route per State overflown' to, in January 2020, the 'actual flown route'.

Looking back, the joint System established by the States has **successfully navigated the many regulatory and technical challenges it has faced.**

Reaching the 50 years milestone was always going to be a good time to look at the achievements of the Route Charges System and acknowledge the future challenges of capacity and sustainability facing the pan-European sky.

First, however, **the unexpected and sudden reduction of traffic resulting from the COVID crisis confronted the system with its biggest challenge so far with respect to the cost recovery policy of the States. How did it fare and is it time to shake up the fundamentals?**

It's all about cost and traffic

States built the Route Charges System on the principle of cost-relatedness.

For that purpose, the costs of service provision are subject to detailed regulatory frameworks, including a performance scheme for States subject to EU law. Figure 2 below shows that some 83% of the costs constitute operating costs, these shares being quite stable over time.[5]

Not only have the shares of what constitutes these costs have remained stable, but the actual costs (in nominal terms) have remained stable as well, essentially staying the same for the last 11 years even though traffic has continued to grow by close to 30% around that same period.[6]

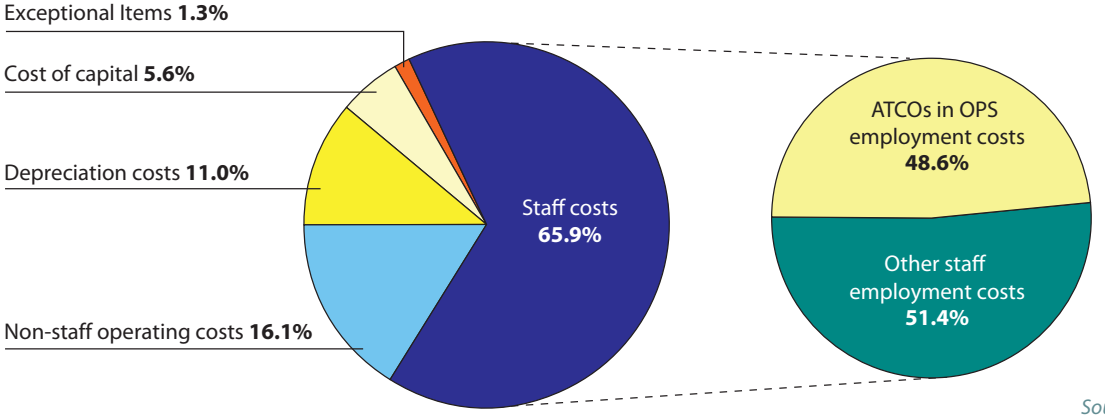
It is easy to see how **the sudden reduction in traffic has had a major impact on the funding of the pan-European ATM system. The continuous flow of funding, normally ensured via the Route Charges System, was put under pressure as the costs remained but the number of flights, and therefore the cash flow to the States and their ANSPs, drastically dropped. While an increase in traffic was clearly not an issue as the data showed, the unplanned level of low traffic of this magnitude was a test of the current funding mechanism.**

Managing the shortfall

The first priority was to ensure the **continuity of operations** despite the shortfall in charges. A number of actions were taken at national and EUROCONTROL level. Mainly this included **cost-containment, mitigation measures and outside funding. EUROCONTROL secured a loan to support States and their ANSPs for that purpose.**

It quickly became apparent that for States subject to determined costs, regulatory adjustments would be required to spread the revenue shortfalls of 2020 and 2021 over the course of the next few years, failing which, unit rates would have seen a huge spike in 2023, making it even more difficult for airlines to recover from the COVID crisis. Nevertheless, **the revenue shortfalls will mostly still be shouldered by the airlines, which will face higher route charges for the coming years.**

FIGURE 2: BREAKDOWN OF ANSP COSTS



Source: ACE Report 2021

"Revenue shortfalls triggered by COVID will mostly be shouldered by airlines, which face higher route charges in coming years - so does the performance scheme still deliver the right results?"

Figure 3 shows the decrease in route charges billed per State from 2019 to 2020. For 2021, based on current traffic scenarios and assumptions for the last few months of the year, the total amount of route charges billed should reach EUR 4 billion.

FIGURE 3: ROUTE CHARGES BILLED PER STATE PER YEAR IN 2019 AND 2020

	2019 in million €	2020 in million €	2020 as a % of 2019
FRANCE	1,317.2	493.2	-63%
GERMANY	961.4	429.7	-55%
SPAIN	796.3	257.8	-68%
ITALY	774.1	255.5	-67%
UNITED KINGDOM	736.6	314.3	-57%
TURKEY	397.3	188.5	-53%
AUSTRIA	225.9	89.4	-60%
POLAND	201.9	94.3	-53%
SWEDEN	191.5	80.6	-58%
NETHERLANDS	190.6	97.5	-49%
GREECE	181.1	86.3	-52%
BELGIUM/LUXEMBOURG	176.4	97.3	-45%
SWITZERLAND	168.7	59.8	-65%
PORTUGAL	152.7	76.9	-50%
ROMANIA	151.5	83.1	-45%
IRELAND	130.0	48.0	-63%
BULGARIA	125.7	49.8	-60%
CZECH REPUBLIC	116.5	49.2	-58%
NORWAY	104.1	58.1	-44%
DENMARK	101.1	40.7	-60%
HUNGARY	94.8	37.1	-61%
CROATIA	92.9	38.4	-59%
SERBIA/MONTEN./KFOR	79.1	36.4	-54%
CYPRUS	65.4	16.7	-75%
SLOVAK REPUBLIC	63.7	21.2	-67%
FINLAND	50.4	20.1	-60%
BOSNIA/HERZEGOVINA	42.6	18.5	-57%
SLOVENIA	37.3	13.6	-63%
LITHUANIA	26.4	12.1	-54%
ESTONIA	26.4	13.2	-50%
LATVIA	25.8	11.9	-54%
ALBANIA	25.2	11.4	-55%
MALTA	22.3	10.0	-55%
NORTH MACEDONIA	17.9	7.8	-56%
GEORGIA	14.5	11.2	-23%
ARMENIA	6.1	1.8	-71%
MOLDOVA	5.1	2.2	-56%
Total	**7,896**	**3,234**	**-59%**

"Total route charges billed in 2021 are expected to reach EUR 4 billion - around half of 2019"

Taking into account that the charges billed on behalf of the States correspond to the revenues of the ANSPs, the expected revenue losses since March 2020 for the years 2020 and 2021, based on traffic assumptions for the last 3 months of the year, should total close to EUR 8.6 billion, as Figure 4 shows.

FIGURE 4: ANSP REVENUE LOSSES IN € SINCE PANDEMIC START

	Losses vs 2019 since March 2020
Mar-20	-227,629,945
Apr-20	-572,788,937
May-20	-603,905,597
Jun-20	-626,103,556
Jul-20	-548,889,078
Aug-20	-470,521,864
Sep-20	-458,036,590
Oct-20	-440,786,059
Nov-20	-366,373,075
Dec-20	-359,398,088
Jan-21	-355,971,357
Feb-21	-345,431,480
Mar-21	-394,940,832
Apr-21	-440,742,275
May-21	-465,154,280
Jun-21	-426,694,070
Jul-21	-332,342,929
Aug-21	-277,457,378
Sep-21	-254,253,568
Oct-21*	-239,113,507
Nov-21*	-188,522,139
Dec-21*	-193,301,902
Total	-8,588,358,506

** Estimated figures*

Based on the current system of over and under recovery of charges, and a considering a number of exceptional measures that were adopted to spread the recovery of the 2020-2021 shortfall, this means that States and ANSPs could in principle recover the vast totality of the EUR 8.6 billion of the costs of air navigation services that were not billed over the course of 2020-2021.

Concretely, this means **if in 2020 airlines flew around 50% of their expected number of flights, they could through the spreading of the unpaid costs of 2020 end up paying for close to 100% of their planned flights.**

So while the system held up as it faced its most challenging crisis and once again adapted, this **underlines the tension between the need for continuous operation of a public service and the user pays principle,** which is at the heart of the current common policy for route charges.

Who should pick up the bill?

In times such as the current crisis, the charges for the ATM system reflect the availability of services to airlines, and not actual service provision. Consequently, as explained above, **in the coming years airlines will be exposed to costs for flights they never flew.**

This begs **a more fundamental question:** given that States are obliged to provide air navigation services to ensure safety in their sovereign airspace and consequently are equally obliged to ensure the continuous availability of these services, **would it not be more appropriate that in the case of a significant drop in the number of flights (and therefore revenue for the ANSPs), the gap would in these unprecedented circumstances be better picked up by taxpayers instead of the airlines?**

Currently, flying has become a commodity and a large part of the population in many countries boards an aircraft or buys goods that have been in the cargo hold of an aircraft. Thus, one could argue that shouldering the availability costs of the ATM system in the case of such a crisis is justifiable – and already possible within the current regulatory framework, as already used by a few States to alleviate the exposure of airlines to the revenue shortfalls of the ANSPs discussed above.

This also calls for **consideration of the different mechanisms that could be entertained in association with the Route Charges System to have available emergency funds – through for example the establishment of a joint fund financed by States, or by having available a stand-by credit facility that could be activated at short notice.** If at first glance these mechanisms could appear as solutions capable of alleviating unexpected funding issues at network level, there are however underlying complexities that should not be underestimated.

Parallel to the fundamental question of the funding of the services is the actual cost of service provision. The costs of

"With ATM system charges based on availability of the service to airlines, and not on actual service provision, airlines will in effect be expected to pay for flights they never flew: is it time for a fundamental rethink?"

service provision, although having stabilised as detailed above, remain very much at the forefront of any discussion relating to charges. **A number of SESAR solutions should bring clear benefits via new technology and consolidation;** reducing the availability costs, as well as increasing the efficiency and resilience of air navigation services, should be the objective of all stakeholders.

Looking ahead

In addition to the crisis-induced and more fundamental discussion on the funding of air navigation services, **one should not lose sight of the challenges that the European network will once again face when traffic recovers to pre-pandemic levels: capacity and delays.** ANSPs will need to be ready to provide the required capacity. This will call for a balance between lowering costs to mitigate the revenue shortfalls, and making the necessary investments and having in place the skilled staff required for the recovery of traffic.

On top of this, certain ANSPs may have to consider the impact of the unit rate in the airspace they manage. Related to the issue of capacity and delays is the cost of a flight and its impact on the planning and operations of airlines.

Charges have been hailed as a determining factor in the planning and capacity of airlines, as well as having an impact on environmental performance – but do they really have that power?

Charges and capacity

"The charging regime for ATM services needs to promote efficient use of the airspace on a network basis, which would lead to improved environmental performance (for example by avoiding that airspace users choose longer routes because the route charges are lower)." [7]

This statement from the April 2019 Wise Persons Group Report set the stage for a review of the charging scheme which could support the efficiency of the network.

On 1st January 2020, changes were introduced in the charging formula to define the distance factor used to calculate route charges, based on the actual route flown as recorded by the EUROCONTROL Network Manager instead of the planned route. One of the identified benefits of this change was to disincentive the use of 'route charges optimised' flight plans and thus r educe the mismatch between planned and actual trajectories. While this eliminated cases of 'route charges optimised' flight plans and established a distance factor that can ensure that air navigation service providers get revenues for the flights they actually have controlled, it did not seem to have removed the possible consideration of route charges in the flight planning operations[8].

Can, and should, more be achieved within the framework of the Route Charges System to eliminate financial considerations in flight operations?

Can charges impact environmental performance?

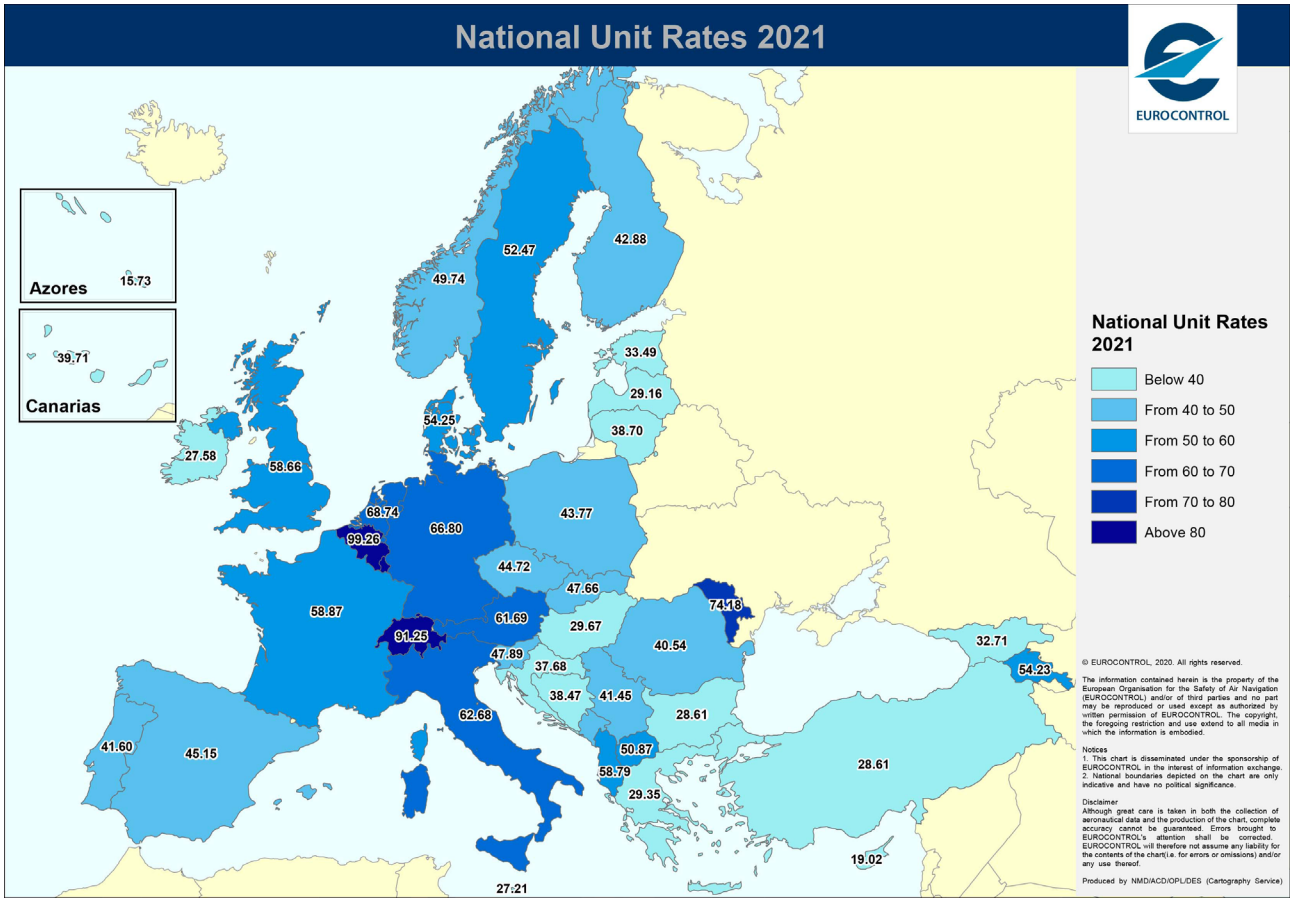
Flying the perfect green flight, as EUROCONTROL Think Paper #10 concludes, is a complex exercise; a lot can however be done now to make flights greener at every stage of a journey, and by every actor involved. As the en route flight phase has the greatest impact on fuel consumption/CO_2, a number of measures were identified to make that part of the flight greener.

And while such factors may have limited impact as they are just some of many considered by airlines, financial considerations can lead airlines to deviate from the shortest constrained route when a less direct route is cheaper to fly due to cheaper airspace r oute charges[9]. Figure 5 shows on the next page, the 2021 unit rates, clearly showing the considerable variation across States.

These **financially d riven considerations by airspace users are due to, at times, considerable differences in the unit rates established by States**. These differences, together with a number of other elements like cost of fuel, arrival punctuality and aircraft load, are considered by the flight planners at the airline when they decide on the route to be flown, and **could lead to a longer than necessary and therefore environmentally more damaging route.**

"Financial considerations can lead airlines to deviate from the shortest constrained route when a less direct route is cheaper to fly - a key sustainability challenge. Could differential pricing be a solution?"

FIGURE 5: 2021 UNIT RATES ACROSS THE EUROPEAN NETWORK



Mitigating capacity and environmental performance impact

One mitigating option would be to establish a common unit rate to eliminate such considerations from operations.[10]

While this may look like an obvious solution, it would not be devoid of challenges and complexities, and calls for further consideration as to how it could be implemented in a way that delivers benefits, considering the limited environmental impact of 'route charges shopping'. The first step towards this development is set out in the **proposed recast Single European Sky (SES) package, where the possibility for the European Commission to establish a common unit rate for en route air navigation services across the Single European Sky is foreseen.** Nonetheless, ensuring at least a similar transparency of the cost charges to the airlines will be a challenge, as will be the unavoidable revenue sharing.

Another way to support the Green Agenda under discussion is the modulation of charges, a tool already available for more than a decade. The use of **modulation of charges to support the deployment of technology supporting environmental performance or for aircraft using sustainable aviation fuels has been raised.** The possible use of modulation for environmental purposes is still subject to discussion as it should also be considered in light of ICAO's policies for charging.

The purpose of route charges - i.e. to recover the costs of air navigation services - should not be lost in the pursuit of strict sustainability objectives, but it should support these if and when possible.

"Time to look at the Route Charges System again from the foundations upwards"

CONCLUSIONS

For 50 years, the Route Charges System has shown its flexibility to successfully adapt to an evolving air navigation services landscape. The CRCO, States, ANSPs, airlines have all played a role in the deployment and operation of a pan-European system that has supported the funding of safe air navigation services in a transparent and reliable manner.

The prolonged crisis resulting from the COVID pandemic has shown however the vulnerability of a charging policy based on availability of services to airlines and traffic forecasts, and not on actual service provision. This means that airlines will end up paying for flights they never flew. While this may be a once in a lifetime event, this has triggered questions on the user pays principle, in particular in view of the overall role of aviation in crises such as this one.

When traffic returns, the European network risks once more being confronted with the pre-pandemic challenges of capacity and delays, and ANSPs will need to balance between providing the required capacity, lowering costs to mitigate revenue shortfalls, and making the necessary investments in staff and infrastructure. And these challenges will also need to balance environmental considerations as European aviation strives to achieve its sustainability goals.

None of these challenges however are insurmountable for the Route Charges System. Its main test will be to strive to keep a common policy that can evolve and accommodate traffic, capacity and environmental challenges; Single European Sky options such as a single unit rate and/or modulation of charges may well merit further consideration.

References

1. For more on the history and evolution of the Route Charges System: François Huet, Chapter 16, "The Regulation of Air Navigation Charges", Achieving the Single Sky, published by Kluwer Law International, the Netherlands, 2011.
2. All EUROCONTROL Member States are Contracting States to the Multilateral Agreement relating to route charges. Ukraine will technically integrate the Route Charges System as of November 2021.
3. EUROCONTROL also bills and collects terminal charges on behalf of 17 States on the basis of bilateral agreements. Overall charges for terminal services across all EUROCONTROL Member States are around EUR 2 billion per year (pre-COVID).
4. Based on ACE Report Preliminary data 2019 – December 2020 (data for ANS).
5. ACE ATM Cost-Effectiveness (ACE) 2019 Benchmarking Report with Special Focus on COVID-19 Impacts in 2020 ATM Cost-Effectiveness (ACE) 2019 Benchmarking Report with Special Focus on COVID-19 Impacts, Prepared by the Performance Review Unit (PRU) with the ACE Working Group, May 2021
6. Based on the data of 25 States over the last 22 years providing 'en route' ATM. These are all of the States that were in the route charges system in 1998 and subject to the Single European Sky legislation in 2019. They accounted in 2019 for 88% of costs in the EUROCONTROL area and 80% of the traffic. See EUROCONTROL Data Snapshot, 23 March 2021.
7. Report of the Wise Persons Group on the Future of the Single European Sky, April 2019.
8. A complete assessment of the impact of the move from M2 to M3 has not been completed as a result of the COVID crisis.
9. See EUROCONTROL Think Paper #10, Figure 7, for more details.
10. Also advocated in the Report of the Wise Persons Group on the Future of the Single European Sky, April 2019, Recommendation 9 for a "Common Route Charge".

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Practical scenario 3

Note: this document complements the core guidelines on the "role of operators' management systems in the COVID-19 recovery phase".

Revision record

Issue	Date of issue	Summary of changes
01	24.07.2020	Initial issue

1. Foreword

The practical scenario mainly addresses the air operators, when identifying and addressing the safety hazards associated with the return to normal operations (RNO) following the COVID-19 pandemic.

The practical scenario has been developed with the support of subject-matter experts from air operators, international associations and national competent authorities.

From a safety risk management's perspective, the practical scenario only provides guidelines for consideration.

The list of "hazards", "threats", "consequences" and "mitigation measures" is **not exhaustive**.

The air operator will have to assess whether these proposed elements are relevant and effective. In no case, the proposed elements pretend to be sufficient or be the right approach to control the risks to an acceptable level.

There is no full risk assessment proposed as such: the comprehensive risk assessment for each identified hazard and consequently the determination of the needed mitigation measures, remain the ultimate responsibility of the air operator, as the context may widely vary from one airline to another.

It can be also useful to consider the other EASA-developed scenarios, which provide with a different list of hazards adapted to the nature of the scenario, but may remain a source of inspiration.

The national competent authorities can also use these good practices in the course of their surveillance activities. However implementation of the suggested mitigation measures are in no case binding as they may not be relevant or appropriate.

Comments, suggestions and improvement can be addressed to safety.management@easa.europa.eu.

2. Desciption of the practical scenario

Context:

A business air operator, after two months of reduced activity, slowly resumes normal operation. Due to the travel restrictions and grounding of airline activity, the operator has started performing ad-hoc cargo flights as a complement to its passenger flights. As such, the air operator performed a first leg consisting of a CAT passenger flight, followed by a positioning (non-revenue) flight to another destination where on the following day it would be conducting a cargo flight. The air operator decided to perform the flights with an augmented crew, but under an FTL exemption.

Each destination still has different health restrictions in place, which means that there are implications on the operation in terms of, for example, the availability of ground handling services as well as limitations in the availability of suitable hotels for overnight. The crew find that, as a consequence of all these factors, they now have other responsibilities and duties to take care of themselves, including, loading the aircraft, preparing the weight & balance sheet, requesting ground transportation and finding suitable rest and meal facilities for their over-night.

Explanation:

As a general comment business operator activities during this sanitary crisis are characterized by:

1. Normal operation patterns is flying in to pick up the passenger and return In normal condition the operator would fly-in, allow rest for the crew, and fly the passengers out.

2. Reduced training (OPC, LPC etc) – simulators in US/Canada/Certain EU countries/etc. with restricted entry possibility.
3. Changes in entry procedure in countries from when the trip is sold to the execution of the flight (very dynamic situation with possible changes day by day) – no over-night possible for crew.
4. Change in country procedures while waiting in another country (very dynamic situation with possible changes day by day) .
5. Business on-demand requires vigilant control of all entry procedures.
6. Operating in "hostile" airspaces/areas – not /or limited availability of en-route alternates due to country procedures, accommodation possibilities, maintenance possibilities, safety of crew and customer.
7. Further travel time and distance to accommodations when on rest in another country – fatigue and possible requirement of increased rest for crew.
8. Limited access to accommodations and food when on rest in another country.
9. Airspace sudden closure (ATC Zero).

As a general comment all the above can lead to a longer planning stage and sudden revise of the planning for the operator. Therefore, during this phase the operator should carefully review its planning procedures.

3. Proposed list of identified hazards with hyperlinks

Instructions: activate the hyperlinks to access the proposed "threats", "consequences" and "mitigation measures" for each hazard listed below

From an ORGANISATIONAL perspective

- Staff psychological stress
- Reduction of safety resources

From FLIGHT OPERATIONS perspective

- Crew reduced situation awareness and reaction time during flight preparation
- Degradation of Handling Skills
- Pairing together pilots / cabin crew with non-recent or partially recent experience
- Inadequate cabin preparation
- Rush during pre-flight
- Lack of social distance when in the flight deck and when not utilising face masks / face coverings

- Possible conflicting information between current and old procedures
- Different levels of knowledge and proficiency of crews
- Insufficient number of pilots and cabin crew to cope with demand
- Crew loading cargo and bags
- Unavailability of hotel close to the airport

From a TRAINING perspective

- Reduced training
- Training programme not updated, following changes and crew exemptions
- Lack of familiarity / training for category "C" airport

From an OPERATION CONTROL CENTER's and CREW SCHEDULE DEPARTMENT perspective

- Reduced staff
- Reduced training of air operator staff
- Inaccurate flight planning (route and crew package)
- New destination or new type of operation(s)
- Rushed release to service of aircraft

From the GROUND DEPARTMENT perspective

- Inaccurate loading procedure
- Increased presence of FOD on apron
- Change of ground handler(s)
- Reduced service / support at destination
- Changes to local travel restrictions and communication of regulatory changes
- Insufficient GSE/vehicles to service aircraft
- Lack of communication with ground handling service provider (GHSP)
- Sanitary procedures not followed by the GHSP staff

From a CAMO and MAINTENANCE perspective

- Rushed release to service
- Prolonged duration of maintenance inspection(s)
- Defects are not rectified in a timely manner
- Limited availability of maintenance staff

- Damages to the aircraft
- Reduced size of the CAMO
- Frequent disinfection of fleet a/c
- Unavailability of spare aircraft or spare parts
- Non-revenue flight after long storage
- Fuel contamination

In addition to the mitigation measures proposed in the next pages, consider the following, which is typical for business operator and valid for all flights:

- Increase check-in time for crew;
- If crew is part of cleaning of aircraft away from home base – increase check-out time;
- Add extra time in planning stage to allow for control of e.g. new procedures when operating in areas outside normal operation pattern;
- Train personnel involved in the RNO in applicable subject of the Covid-19 Risk Assessment and Mitigating measures.

AREA	ORGANISATIONAL (Staff wellbeing, Commercial & financial pressure, etc.)		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Job instability/uncertainty Financial distress	**Staff psychological stress**	Staff and crew (un)well-being Psychological pressure (appetatite to accept higher risks) Errors / lapses Fatigue Diminution of alertness Increased risk-taking	Explanation: During the period of unprecedented job instability and cost-savings, staff are facing psychological pressure and stress with possible consequences on their safety performance. Productivity gains from crews will involve extending maximum working hours allowed in a duty period, reducing rest periods during duties. Overhaul of pay and benefits may be central. Mitigation: - Clear communication with the staff on airline strategy (business recovery plan): it is important that there is a robust and centrally coordinated communication strategy in place to prevent rumor and misinformation that will create more uncertainty and stress. Such communication should provide up to-date and reliable information to employees and customers. - Staff resource plan timely adapted to the short, mid and long term operation outlook - Access to mental wellbeing support programs such as pilot peer support (see EPPSI[1]) – see also Commission Regulation (EU) 2018/1042[2] - Direct Management Contact with Staff highlighting the importance of the safety and wellbeing of all colleagues as a top priority and outlining the employee supports available (e.g. Employee Assistance Programmes (EAP). - Remind the employees of the organisation's Just Culture

[1] European Pilot Peer Support Initiative at http://eppsi.eu/

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1591935555034&uri=CELEX:32018R1042

AREA	ORGANISATIONAL (Staff wellbeing, Commercial & financial pressure, etc.)		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress	**Reduction of safety resources**	Reduced effectiveness of safety and compliance staff / department Ineffective monitoring of management system key processes such as the hazard identification and risk assessment process. Backlog in audit plan / decreased performance Dismissal or furlough of key staff Loss of competence due to cost-saving measures Increased workload due to COVID-19 management of change activities (downsizing, COVID-19 contingency measures, re-start of operations).	Explanation: During the commercial and financial difficulties, operators might be tempted to cut the resources in the whole organisation. Safety and compliance might be affected by these cost-saving measures. However, organisations have to rely on safety and compliance monitoring function during the critical phases of the re-start. Therefore, organisations should avoid any cost-saving measures in this area. Mitigation: - Clear business plan to restart operations and manage changes considering short/medium/long term communication; transparency on the recovery plan towards all employees and towards the overseeing authorities - Identification of critical tasks and prioritization of tasks - Strengthen safety and compliance monitoring capabilities - Adapt the frequency of the SRB meeting and SAG if appropriate - Procedure to monitor the wellbeing of staff where to report any concern in an anonymous and confidential manner - Promote internal reporting culture to facilitate the identification of possible negative safety trends - Compliance is paramount

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Lack of Exposure due to stopped Operation Pilot with reduced recent experience/exposure Pilot without recent experience/exposure (basically the same as above but even exaggerated)	**Crew reduced situation awareness and reaction time during flight preparation**	Incorrect fuel decision Not recognizing MEL/Maintenance issues Not realizing possible mistakes in Flight planning/calculation Missing items in e.g. briefing, Inadequate A/C preparation Ineffective walk around Wrong cockpit preparation Incomplete Flow Pattern Take off abort Incorrect A/C configuration	Explanation: Flight preparation is a key process to ensure a safe flight. Due to the lack of recency and self-confidence, the probability of not performing an accurate flight preparation is higher after prolonged crew inactivity. Checking pre-flight documents, e.g. OFP, weather, NOTAMS, Aircraft/maintenance documents etc. and fully comprehending the meaning (having a mental picture) takes significantly longer than usual, due to the lack of routine. Mitigation: - Air operator should consider reviewing the time planned for the flight preparation on ground. - Air operators may consider reviewing its pre-flight briefing package to optimize the flight preparation and prevent possible shortcomings.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Pilot with reduced recent experience/exposure Pilot without recent experience/exposure (basically the same as above but even exaggerated) Loss of skills by a pilot not flying over 90 days but not more than 120 days Loss of skills by a pilot not flying over 120 days but not more than 150 days (only for some pilots – but they still could made members of a crew)	**Degradation of Handling Skills**	Exceeding operating limits (Max flap speed, MMO, Max extended gear speed) Unstable approaches Handling errors Disrupted Flow Pattern Runway excursion Tail strike (during T/O and/or landing) Hard landing Upset Recovery skills Incorrect A/C configuration Incorrect execution of emergency procedures (e.g engine out, engine fire, etc)	Explanation: Most of the air operators had to reduce their flying activities during the peak of the pandemic. This may have had an impact on pilot flying skills. In the same vein, young pilots with limited experience may be more impacted that experienced pilots. Mitigation: - Consideration on pilots with limited flying experience should be given when considering training requirements before returning on duty after long inactivity - Consider SIM training specifically addressing handling skills, including e.g. T/O, and LDG in various crosswind scenarios, RWY condition, light conditions, A/C weights; - Consider to develop specific briefing for LTCs and TRIs during RNO to address specific reduced experience-related issues - Avoid any amendment to SOP during the RNO phases - Consider discussing possible RNO scenarios during classroom / WebEx / ELearning or distance learning / briefing to increase crew awareness on possible risk during the RNO - Roster, when possible, crew with recurrent training not expired – or consider pairing experienced and non (recent) experienced crew after the conducting of a risk assessment. - Consider the possibility to plan the roster of pilots without recent experience paired with a line training captain or a TRI

			- When no option available other than rostering pilots without recent experience, consider to apply operational limitations [e.g. reduction of maximum crosswind component, increased operational minima etc.]

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Inadequate crew rostering procedure Commercial pressure Lack of crew availability	Pairing together pilots / cabin crew with non-recent or partially recent experience [e.g. pairing of two pilots neither of whom have carried out any flight in the preceding 90 days]	Poor CRM New integrated procedures partially known Exceeding operating limits (Max flap speed, MMO, Max extended gear speed) Unstable approaches Handling errors Disrupted Flow Pattern Runway excursion Tail strike (during T/O and/or landing) Hard landing Upset Recovery skills Incorrect A/C configuration	Explanation: Due to financial distress, airlines may decide to reduce the number of crew. The reduced availability of pilots may have an impact on the pairing of the crew Mitigation: - Specific guidance to be developed for the scheduling department and communicated to the crews - Additional operational restrictions to be imposed in relation to crew compositions - Consider rostering experienced pilots for the first flight of an aircraft just after prolonged storage - Update roster documentation to include information about exemptions

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Cabin Crew with reduced or no recent experience/exposure	**Inadequate cabin preparation**	Missing items Inappropriate security search Ineffective safety briefing Errors in arming/disarming emergency doors Incorrect safety equipment check Medical skills	Explanation: Cabin crew impacted by reduced flight activities will be prone to possible errors during the preparation of the aircraft. Mitigation : - Air operator should consider reviewing the time planned for the preparation of the aircraft - Air operators may consider introducing a dedicated Check List to support the cabin crew tasks on ground - Air operators may develop training material and procedures about medical issues related to COVID-19 consequences - Consider classroom training to highlight specific focus areas.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Increased time to access the airport and the aircraft parking position Crew loading cargo during cargo flights Loading items beyond exempted quantities (medical equipment to support population at destination)	**Rush during pre-flight**	Wrong entries on FMS during pre-flight Errors in performance calculation Errors in W&B calculation Poor pre-flight briefing Inadequate cockpit preparation Wrong aircraft configuration (i.e. pitot cover or landing gear pins not removed, not all covers / doors safely fastened) Take off abort Fatigue Impairing emergency evacuation and access to emergency equipment (due to load shift) Injury to cabin staff (in case of turbulence and load shift)	Explanation: Pilots and cabin crew may face commercial pressure during the restart of the activities Mitigation: - Air operators should adapt the time allocated for pre-flight duties according to the “new” aerodrome procedures [e.g. consider possible delays during security and new procedures related to the access of the airport and aircraft etc. This includes boarding etc.] - Remind the crew of the importance of a safe operation and the organisation’s Just Culture in these challenging times.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
High transmissibility of Covid-19 Access to the cockpit and cabin by external staff	**Lack of social distance when in the flight deck/cabin and when not utilising face masks / face coverings.**	Eroding staff confidence in health and safety measures , with an impact on crew wellbeing Spreading of COVID19 within the organization and to passengers	Explanation: Face masks / coverings have been deemed inappropriate for flight deck/cabin crew use due to concerns relating to depressurization, communications and potential O2 mask use. Social distancing remains a must. Mitigation: - Increased Flight deck/cabin cleaning & sterilizing according to air operator's approved procedures, clearly communicated to the crews - Crew self-declaration procedures prior to duty ("fit for flight"?) - Procedures and provision of virucidal hand wipes and virucidal surface wipes to clean & pre-prepare all contact surfaces or any other sanitary means - Air operator shall verify the appropriateness of procedures for Ground Handling Service Provider (GHSP) staff to access the aircraft during turnaround.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New or additional COVID-driven procedures (e.g. specific announcements, use of PPE, Sanitation requirements)	Possible conflicting information between current and old procedures (SOPs, OMA, OMD etc.)	Additional Workload Confusion Wrong prioritization of tasks Fatigue Mental overload, leading to lapses and errors in all fields Wrong duty period calculations	Explanation: During the phase of reduced flight activities, the air operator may have the need to review some procedures or processes. Moreover, during the same period, most of the staff were in lockdown; crew and staff may not be aware of changes because manuals have not been updated due to the possible temporary basis of changes Mitigation: - Verify that official manuals have been amended to include latest revisions and staff receive adequate information or training

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New procedures and documentation developed during the low activity phase Temporary procedures	Different levels of knowledge and proficiency of crews (flight and cabin crew)	Use of wrong procedures Mix up of various procedures Ineffective CRM Application of different procedures	Explanation: Due to the reduced availability of training event and lockdown effect, information provided or amended by the air operator may have not been properly understood or received by the relevant staff. Mitigation : - Avoid the introduction of any new procedures before crews are properly trained / make sure which procedures should be used.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress Aggressive cost-saving policy	**Insufficient number of pilots and cabin crew to cope with demand**	Inadequate crew pairing Fatigue Inadequate rest Greater pressure to 'pass' pilots during test or simulator sessions Delay or flight cancelation	Explanation: Many organisations have laid-off pilots and cabin crew. As demand picks up quicker than anticipated, there will be increased strain on available resources. The lead time for recruiting and training staff is far greater than the speed for traffic recovery. Organisations may be tempted to hire contracted (temporary) pilots to cope with summer peak; the level of uncertainty may be high with the potential second-wave expected during the autumn/winter. Mitigation: - Clear business plan to restart operations and manage changes considering short/medium/long term communication, accompanied by transparency towards the employees and towards the overseeing authority with respect to all elements of a recovery plan - Consider crew pairing and adequate rostering - Monitor the different stages of the pandemic and review the business plan in a dynamic manner.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Limited availability of training event Rush operation Inadequate distribution of new procedures Additional (new) Crew Responsibilities (preparing load instructions and weight&balance sheet)	**Crew Loading cargo and bags**	Crew injuries Pilot "incapacitation"/unable to continue the flight Flight delay Flight cancellation Inadequate cargo loading Cargo not secured Inadequate aircraft performance Fatigue Cargo loaded on seat	Explanation: In business aviation it is normally the crew who load the aircraft and then maneuver the bags inside the cargo bay in order to make sure everything fits. In doing so, physical injures sustained to the back, neck, shoulders etc. is not uncommon. Cuts and bruises also occur as flight crew strike their head on structural parts as they try to work in the confined space. Transporting cargo may well be an aggravating factor and a cause for increased cases of crew injuries, which in an extreme situation could lead to restricting the physical ability of the pilot to handle the controls or, worse, lead to incapacitation. Mitigation: - Inform brokers/customers about size and quantity of cargo allowed. Carefully assess Exempted Dangerous Goods - Provide the crew with clear procedure on how to load the cargo as well as on cargo limitation in terms of weight and dimension - Provide the crew with sufficient extra time for performing the loading of cargo - Provide the crew with clear procedure on how to secure cargo in cabin and in cargo bay - Train the crew on the new procedure including loadsheet preparation and cargo secure - Provide the crew with clear and easy accessible documentation, e.g. specific QRG (quick reference guidance), tools (e.g. approved Loadsheet programme for EFB) for the new tasks. - Simplify/standardize loading procedures

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Travel restriction Health and care new restriction	**Unavailability of hotel close to the airport**	Rush aircraft preflight FTL exceedance Fatigue Stress Human factor error	Explanation: The unavailability of suitable hotels and facilities due to COVID19 restriction may have an impact on flight operations and crew. Some hotels, those at or nearby airports may have closed and crew now need to travel further and longer to find a suitable hotel. Hotels may only partially be open and access to the fitness centre and restaurants may be unavailable or limited. Mitigation: - Carefully plan the flight and when hotel need to be change: - increase the time for commuting from hotel to airport - Increase the time allocated to preflight tasks - Operator to enhance its Fatigue Risk Management (FRM) processes & set up / involve the Fatigue Safety Action Group (FSAG) - FTL limitations to be fully applied by the operator (= as a basic line of defence to underpin FRM) - Operator to encourage crew to report fatigue to allow detecting fatigue hazards & set up mitigations - Assess if EFB used for load and trim sheet is able to record masses on seats - Provide adequate training to crew on how to secure the load on seat

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Extensive/accumulated use of alleviations Aggressive cost-saving policy	**Reduced training**	Degradation of professional competencies Reduced decision making skills Reduced CRM Reduced situation awareness Degraded understanding of aircraft performance Poor performance in execution of emergency procedures Memory item not recalled	Explanation: Due to the reduced availability of training event and lockdown effect, many staff may have not received adequate training and this can be aggravated by financial distress. Mitigation: - Review the training programme to ensure that essential training needs will be delivered.Consider SIM training specifically addressing handling skills, including e.g. T/O, and LDG in various crosswind scenarios, RWY condition, light conditions, A/C weights etc. *Note: TRI, TRE and LTC recency should be maintained to allow for continuation / additional training when required.*

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Unavailability of training means Lack of simulator access	**Training programme not updated, following changes and crew exemptions**	Negative training Not confident crew Degradation of professional competencies Diminution of training efficiency Inability to perform specific training manoeuvers that are only possible in FSTDs Training not delivered Reduced effectiveness of training	Explanation: Possibility of negative transfer of training due to wrong emphasis (check vs. Training, emphasis on legal requirements instead on crew proficiency). Insufficient simulator availability to conduct necessary crew training. Particularly an issue for air operators who do not have their own simulators and are dependent on third-parties. Mitigation: - Air operator's crew training department has to consider to perform a training gap analysis to identify the most significant areas affected by the crisis - The analysis of the training needs shall include granted exemptions, lack of exposure, training refreshers, new procedures, new operations etc. - Update the training programme according to the outcome of the gap analysis to address the most critical training items not covered due to the unavailability of simulators and training facilities.

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Lack of familiarity / training for category "C" airport	Pilots not qualified to fly to certain destinations Approach and landing incidents	Explanation: Restricted access to simulators means that training for special airports may be limited, rushed or overlooked altogether. Mitigation: - Air operators should consider temporary alternative way to qualify the crew, being approved by the NCA and amend their procedures – such measures can only be temporary and re-assessed based on the evolution of the situation - Adapt the roster policy accordingly

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure / labor laws (e.g. short time work regulations)	**Reduced staff**	Inaccurate flight planning, including route, fuel, and alternate planning (e.g. firefighting capacity required might have changed) No update information Error Erosion of experience High workload as demand picks-up Fatigue and crew fatigue	Explanation: Cost-saving measures may affect all staff, including OCC staff and Crew schedule department. This may affect the quality of the flight planning and flight preparation. Mitigation: - Plan the flight considering contingency plan – on several levels and for different scenarios. - Develop specific GM / Check-Lists / What-to-do Lists for every scenario and train the crews on the way those should be applied. - Organise a special team of experts available for the crews for instant remote contact – with a task to support the crews - especially if those crews are already in the air. - Plan to restart the operations on a step-by-step basis. Plan enough time for Q&A. Understand what is hampering the new developed SOPs – what is working and what is not.

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New procedure New policy New type of operation New destination	**Reduced training of air operator staff**	Inaccurate flight planning Error Inaccurate performance calculation Stress	Explanation: Cost-saving policy will have an impact on the availability of training. Mitigation: - Air operators may consider to give extra time for the flight planning and preparation of the flight briefing package. - Use double-checking if possible for the preparation of flights to new destination(s)

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Inaccurate flight planning (route and crew package)	Wrong Operational Flight Plan Increased number of diversion Increased flight time Inappropriate ATC clearance Inaccurate fuel planning Wrong NOTAM or miss newly published NOTAMs Aerodrome closed Missing airspace restriction Changes in entry procedure in countries from trip is sold to completed Change in country procedures while waiting in another country	Explanation: Flight planning quality may be affected by an increased number of NOTAMs as well as by unavailability of navigation aids, closure of airspace etc. Mitigation: - Air operator has to review its procedures for flight planning to allow more (and sufficient) time, and adequately address any safety issues that may hinder the quality of flight planning (including impact of Covid-19 measures introduced in crew and flight planning facilities, having possible impact on time spent in the facilities) - Evaluate the availability of usual en-route alternates that may be closed due to the crisis. - Plan the flight considering contingency plan – on several levels and for different scenarios. - Develop specific GM / Check-Lists / What-to-do Lists for every scenario and train the crews on the way those should be applied. - Ensure sufficient resource to manage the volume of NOTAMS (process AU, Volume to be proactively managed) - Contact destination aerodrome / airport before the flight to ensure the accuracy of information.

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	New destination or new type of operation(s) COVID related entry / immigration restrictions	Wrong Flight Plan Inaccurate flight envelope preparation Inaccurate aircraft performance Destination/Enroute Alternate/Alternate planning not considering COVID related restriction (NOTAM)	Explanation: Air Operators may have the opportunity to open new destinations where it does not have experience Mitigation: - Air operator has to review its procedures for flight planning to allow more time and adequately address any safety issues that may hinder the quality of flight planning. - Evaluate the availability of usual en-route alternates that may be closed due to the crisis. - Plan the flight considering contingency plan – on several levels and for different scenarios. - Develop specific GM / Check-Lists / What-to-do Lists for every scenario and train the crews on the way those should be applied. - Ensure sufficient resource to manage the volume of NOTAMS (process AU, Volume to be proactively managed) - Contact destination aerodrome / airport before the flight to ensure the accuracy of information. - Evaluate aircraft performance carefully before selecting the aircraft type to use. - Consider COVID related rules/regulations/entry and immigration restriction already in flight planning phase and crew information package - Crew scheduling: enhance Fatigue Risk Management (FRM) processes, set up / involve the Fatigue Safety Action Group (FSAG), encourage reporting.

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Lack of fleet availability	**Rushed release to service of aircraft**	Release to service of a non-airworthy aircraft Release of an aircraft with MEL non-compatible with the destination	Explanation: Due to the reduced availability of aircraft that are under storage conditions, the air operator may not have sufficient aircraft to cope with the commercial demand. Mitigation: - Air operator has to proactively establish a plan to focus on aircraft coming out of parking/storage and evaluate the timeframe required to de-store and get additional aircraft ready for operations

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New procedures New type of operation(s)	**Inaccurate loading procedure**	Degradation in aircraft performance/out of trim condition Tail strike (TO and landing) Runway overrun	Explanation: Due to the introduction of new type of operations or new configuration of the aircraft, ground handling can be impacted. Mitigation: - Amend ground operation manual procedures - Ensure proper equipment available at destination. - Contact destination aerodrome / airport and all subcontractors there before the flight - Monitor / check the loading of the aircraft. - Deliver adequate training

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Reduction of airport activity Reduction of ground staff Pressure on staff	**Increased presence of FOD on apron**	Damage to aircraft Delay Flight cancellation	Explanation: There is the increased risk of FOD damage due to unmaintained/degraded airport movement surfaces (particularly ramp and taxiways). Mitigation: - Air operator should evaluate to increase FOD risk awareness among crew - Air operator should verify/introduce procedure to ensure ground staff checking for FOD

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Bankruptcy of usual ground handling company Large turnover of staff for GH SP (Lack of experience or qualifications)	**Change of ground handler(s)**	Inadequately trained staff Lack of qualified staff Loading errors Different ground handling procedures Possible injuries of staff Load planning / load sheet errors Degradation of ground handling standards Difficulty in verifying compliance prior to starting operations (oversight of subcontractors) Insufficient GSE/vehicles to service aircraft Lack of training	Explanation: Air operators may decide to change ground handlers following cost-saving policy or may be forced to change ground handlers due to the unavailability of the previous agent(s). New ground handling staff can be unfamiliar with the airlines standards. Mitigation: - verify that the new ground handling service provider received the aircraft documentation and the staff received the appropriate training - Preparation of Quick reference Guides and Read and do lists for Ground Crews - Evaluate ground handlers' capability to properly service the aircraft and follow the air operator's procedures.

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Uncertainty of available ground handling services at the destination Large turnover of staff for GH SP (Lack of experience or qualifications)	**Reduced service / support at destination**	Loading errors Different ground handling procedures Possible injuries of staff Load planning / load sheet errors Inadequate supervision of boarding procedures Incorrect fuel uplift	Explanation: No or not the full extent of service/support is available. In addition the turnover of staff for GH SP is well known Mitigation: - Consider possible contingency situation during flight planning. - Consider performing a remote inspection [at least desk-top review of manuals and procedures] of the GH SP (oversight of the subcontracted activities) - Air operator has to identify the significant changes affecting the GH SP.

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Changes to local travel restrictions and communication of regulatory changes	Inadequate passengers handling Inappropriate boarding procedures Last minute weight and balance change errors Unruly passengers	Explanation: Covid-19 pandemic may lead to changes and/or restrictions to airport procedures Mitigation: - Air operator needs to inform passenger in advance of possible disruption - Air operator has to consider the amendment of standard instructions to GHA - Cabin and cockpit crew should be informed about the changes, restrictions, procedures at the destination.

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Budget cut	**Insufficient GSE/vehicles to service aircraft.**	Risk of damage event Undue delays Risk of missed flight connections	Explanation: GH services may be reduced due to budget cut. Mitigation: - review the turnaround time and impact on Flight Duty Period - consider to timely inform the passengers

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Lack of communication with ground handling service provider (GHSP)	Changes to DOW/DOI not notified Loading and/or W&B documentation errors	Explanation: The changes in procedures, documentation have not been communicated to the GH SP Mitigation: Review the communication policy with the GH SP

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Spread of Covid19	**Sanitary procedures not followed by the GHSP staff**	Aircraft and people on board contaminated with infectious disease	Explanation: GH SP may have procedures to cope with the pandemic. Mitigation: - additional cleaning requirements; consider EASA Safety Directives 2020-03[3] and 2020-04[4] - verify the adequacy of the air operator's procedures with the GHSP - consider EASA /ECDC Aviation Health Safety Protocol5; latest revision of SIB 2020-025; and the EASA guidance on "Management of crew members" and on "Aircraft cleaning and disinfection"

[3] https://ad.easa.europa.eu/ad/SD-2020-03
[4] https://ad.easa.europa.eu/ad/SD-2020-04
[5] https://www.easa.europa.eu/newsroom-and-events/news/passenger-health-safety-updated-measures-summer-2020

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Reduced staff Staff overloaded Lacking availability of qualified personnel High number of engineering recurrent training overdue HF impact on line or base Maintenance department due unforeseen workload Time pressure Psychological pressure and wellbeing High number of aircraft have been stored. Some may have been parked away from the availability of a maintenance organisation.	**Rushed release to service of aircraft**	Aircraft not compliant with the airworthiness requirements Damage or failure not detected or fixed Aircraft engaged beyond technical limits or not properly trouble-shooted Possible triggering of real or spurious warnings and indications Unclear technical status Significant number of deferred defects and open MEL items Delay / inflight turn back / diversion / aborted T/O Backlog of Aircraft Maintenance Programme (AMP) tasks Airworthiness exemptions (such as AMP tasks extension or ARC validity) Errors due to time or psychological pressure	Explanation: Aircraft Systems after mid/long term storage tend to be less reliable. Many calendar-based maintenance items may be overdue. Due to the pandemic, some maintenance organisations may have reduced the number of staff. During the lockdown, the CAMO may have stopped its activities: the airworthiness status of the fleet may be uncertain; some ADs may not have been carried out etc. Mitigation: - Sufficient time should be given to the CAMO to re-assess the airworthiness status of the aircraft, especially when re-engaging the aircraft after de-storage and prepare the maintenance package for the Aircraft Maintenance Organisation(s) (AMO). - CAMO should plan sufficient time to let the AMO carry-out the maintenance package, keeping in mind that the de-storage of the aircraft will reveal defects, which will impact the duration of the maintenance check. CAMO and AMO should anticipate the availability of spare parts. - Coordination between the OCC, the CAMO and the AMO should be ensured to better plan the availability of the aircraft for the air operations. - The airworthiness status of the aircraft should be carefully followed-up and passed to the OCC for the flight preparation so that the crew are fully aware of the aircraft status, defects and open MEL items before starting air operations - The OCC and CAMO in liaison with the AMO should double check the airworthiness status and the release to service of the aircraft with a

		Flight Crew could be unaware of the fact that aircraft is not airworthy Aircraft databases not updated	special attention to the defects found during the checks or incomplete tasks. - As regards to exemptions: the air operator should avoid the compounding effect of cumulative exemptions granted in other domains [airworthiness exemptions with exemptions related to the lack of crew's recent experience]. Plan carefully the crew pairing. - Ensure that the pilots will be notified that the aircraft has just been de-stored (i.e. first flight after de-storage) - After de-storage, the air operator may decide to plan a non-revenue flight before dispatching the aircraft for operations, to check its airworthiness. - Ensure adequate maintenance contract(s) and maintenance capabilities at the aerodrome where the aircraft has been stored. - Ensure that the availability and capability of maintenance organisations at the destination.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Reduced staff Lack of qualified personnel High number of engineering qualification overdue HF impact on Line or base Maintenance department due unforeseen workload Time pressure Psychological pressure and wellbeing High number of aircraft have been stored. Some on them have been parked away from the availability of a maintenance organisation	**More time needed for maintenance inspection(s)**	Aircraft not airworthy Damage or failure not detected or fixed Aircraft engaged beyond technical limits or not properly trouble-shooted Possible triggering of real or spurious warnings and indications Unclear technical status Significant number of deferred defects and open MEL items Delay Backlog of Aircraft Maintenance Programme (AMP) tasks Airworthiness exemptions (such as AMP tasks extension or ARC validity) Errors due to time or psychological pressure Flight Crew could be unaware of the fact that aircraft is not airworthy	Explanation: Because the aircraft did not fly for a long period of time, the number of maintenance tasks and inspections needed to re-store the aircraft back to operations will be higher and a longer time to complete them will be necessary. The nature of the inspections could be also altered. Unavailability of spare parts may impact the delivery of the aircraft. Mitigation: - Sufficient time should be given to the CAMO to re-assess the airworthiness status of the aircraft, especially when re-engaging the aircraft after de-storage and prepare the maintenance package for the Aircraft Maintenance Organisation(s) (AMO). - CAMO should plan sufficient time to let the AMO carry-out the maintenance package, keeping in mind that the de-storage of the aircraft will reveal defects, which will impact the duration of the maintenance check. CAMO and AMO should anticipate the availability of spare parts. - Coordination between the OCC, the CAMO and the AMO should be ensured to better plan the availability of the aircraft for the air operations. - The airworthiness status of the aircraft should be carefully followed-up and passed to the OCC for the flight preparation so that the crew are fully aware of the aircraft status, defects and open MEL items before (re)starting air operations - The OCC and CAMO in liaison with the AMO should double check the airworthiness status and the release to service of the aircraft with a

			special attention to the defects found during the checks or incomplete tasks. - Ensure adequate maintenance contract(s) and maintenance capabilities at the aerodrome where the aircraft has been stored. - Ensure that the availability and capability of maintenance organisations at the destination.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress of the air operator Poor safety culture	**Defects are not rectified in timely manner**	Operations with multiple open MEL items In-flight failures. Spurious alarms Increase of workload for the pilotsTake-off abortion Delayed entry into teclog of defects Multiple extension of MEL Delay / flight cancellation / diversion / aborted take-off	Explanation: Due to the cost-saving policy, the air operator may elect to postpone maintenance tasks as much as possible. Postponing the rectification of defects when the trouble-shooting is demanding may be exacerbated. Mitigation: - Avoid to postpone any maintenance task on aircraft with already open MEL items - Clearly define a policy to prioritise rectification of defects based on the impact on planned operations. - CAMO should re-enforce the monitoring of the maintenance defects and a policy to handle the rectification of defects and well as postponed maintenance. - Cross-checking the recorded defects in the maintenance on board computer with the tech-log entries should complement the CAMO monitoring.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Maintenance providers limit supported locations	**Limited availability of maintenance staff**	Aircraft in AOG Cancellation or delay of flights Commercial pressure to operate the aircraft with deferred items Extensive use of MEL Repair interval extension Delay entry in technical logbook of aircraft defects	Explanation: Air operators may face difficulties with the maintenance service provider that had to reduce the number of staff due to the consequences of the pandemic. Mitigation: - Establish a communication line with the maintenance providers to understand their capability to cope with the maintenance needs and plan aircraft use in coordination with the OCC - Prepare a contingency plan - Make sure that the crew clearly understands their remit and privileges related to the MEL items and associated maintenance actions. - Check the robustness of an internal policy on the dispatch of aircraft with open MEL. - Ensure the monitoring and analysis of repetitive defects by the CAMO in order to be proactive in the identification of possible hazards

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Prolonged parking Inappropriate application of prolonged parking procedure and de-storage	**Damages to the aircraft**	Aircraft in AOG Delays Unknown failure of emergency systems Undetected damages to a/c systems such as leaking actuators, sealing, structure-'Sticky' Valves, Dried-Out Seals, Avionic faults, corrosion of metals etc.	Explanation: During prolonged parking, aircraft may have been damaged. These damages may have not been reported to the air operator. Mitigation: - The air operator may consider the development of a robust pre-flight inspection procedure after prolonged parking. [i.e. first inspection]. - First pre-flight inspection should be carried out by qualified maintenance staff in support of the crew.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress	**Reduced size of the CAMO**	Possible overruns on maintenance tasks Overdue Airworthiness Directive(s) (AD) or missed AD Inappropriate management of maintenance tasks and airworthiness status of the fleet Not appropriate evaluation and follow-up of technical log book entries Lack of competence due to laid-off personnel	Explanation: Due to the cost-saving policy, the air operator may decide to reduce the size of the CAMO to the minimum. Mitigation: - The air operator shall analyse the impact of this staff reduction and develop a robust procedure to ensure the airworthiness of the aircraft. - The air operator should develop an effective mapping of CAMO staff competences in order to ensure the continuing airworthiness monitoring function. - The air operator and its CAMO should ensure an effective line of communication with the maintenance organisation for a better coordination about the maintenance actions to take

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	AMP not adapted to the utilisation of the fleet	Damage to a/c systems Corrosion Wrong utilization of some fleet aircraft Reliability programme not anymore relevant	Explanation: The frequency of the Aircraft Maintenance Programme (AMP) items are based on the number of flight hours and cycles. Due to the reduction of activities, the determination of these frequency as well the nature of the maintenance inspections might not be any more adapted to the RNO. Mitigation: - The air operator and its CAMO should reconsider the impact of the volume of flight and new types of operations on the relevance of the AMP. - The air operator and its CAMO should reconsider the relevance of the reliability programme.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Frequent disinfection of fleet a/c	Damages to cabin interiors, flight deck Corrosion on exposed a/c structure, Defects to cabin electronic system [IFE, PSU, FAP] Unknown long term effects of disinfection on aircraft hardware	Explanation: Repetitive use of disinfectants or any other sanitary products may damage aircraft systems and structure. The existing AMP does not explicitly address deterioration of interior hardware from the extensive use of disinfectants. Mitigation: - The air operator and its CAMO should follow the manufacturer instructions about the cleaning and disinfection of the aircraft. - The air operator and its CAMO should consider whether maintenance inspections should be added to the AMP and any other associated documents such as the pre-flight or daily C/L.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial pressure or distress	**Unavailability of spare aircraft or spare parts**	Delayed maintenance Postponed maintenance, Prolonged AOG Prolonged operations under MEL + RIE Spare aircraft non available delay Increased rate of swapping equipment between a/c Damages Air operator uses parts from a parked aircraft to dispatch the operating fleet. Unknown airworthiness status of the parked aircraft from which parts have been cannibalised	Explanation: The air operator may not have a spare aircraft or spare parts available in case of dispatch issue. Therefore it may be necessary to dispatch an aircraft with deferred items. Mitigation: - The airworthiness status of the aircraft should be carefully followed-up and passed to the OCC for the flight preparation so that the crew are fully aware of the aircraft status, defects and open MEL items before (re)starting air operations - The air operator shall develop a proactive policy for the management of the supply chain. - The air operator with its CAMO should consider to develop a procedure to ensure the airworthiness and the release to service of the parts taken from the parked aircraft. The status of the cannibalized aircraft should be clearly recorded.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Prolonged parking in a location where a maintenance organisation is not available Wildlife Nesting	**Non-revenue flight after long storage**	Not airworthy aircraft Degraded aircraft systems Inadequate application of non-revenue flight procedures Clogged pitots, landing gear bay, APU exhausts, other Vents/Orifices damaged by wildlife Low or high rejected T/O Unreliable high speed event	Explanation: The aircraft may have been parked in allocation far away the availability of a maintenance organisation to restore its airworthiness. Consequently a non-revenue flight is needed with exemptions approved by the State of registry. Mitigation: - The air operator should develop a robust procedure and policy for the ferry flight and the maintenance check flight. - The air operator shall develop a clear procedure for the OCC, when planning a non-revenue flight. - The air operator shall ensure that the pilots qualified for the maintenance check flight received adequate information in coordination with the CAMO and AMOs on the maintenance tasks performed on the aircraft. - The air operator shall ensure that the pilots receive relevant information before the non-revenue flight, including flight restrictions or conditions associated to the exemptions [e.g. landing gear down, maximum flight speed or flight level].

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Prolonged parking in a location where a maintenance organisation is not available	**Fuel Contamination**	Filter clogged Engine flameout Reduced performance of the aircraft Delay or flight cancellation	Explanation: Fuel after prolonged storage may be contaminated Mitigation: - The air operator has to develop a robust procedure to ensure that, after prolonged parking, the quality of fuel is checked before the first next flight. In addition, with the possible contamination of fuel tanks at the aerodrome, the procedure can be extended to the next flights to come. - The air operator shall ensure that the CAMO and AMOs adhere to the manufacturer instructions as regards to fuel contamination [e.g. Airbus issued In-Service-Information 28.00.00166 on Fuel]. C/L, pre-flight or any other documentation should be amended to put emphasis on this safety issue.

Practical scenario 4

Note: this document complements the core guidelines on the "role of operators' management systems in the COVID-19 recovery phase".

Revision record

Issue	Date of issue	Summary of changes
01	20.10.2021	Initial issue

1. Foreword

The scenario mainly addresses the air operators, when identifying and addressing the safety hazards associated with the return to normal operations (RNO) following the COVID-19 pandemic.

The scenario has been developed with the support of subject-matter experts from air operators, international associations and national competent authorities.

From a safety risk management's perspective, the scenario only provides guidelines for consideration.

The list of "hazards", "threats", "consequences" and "mitigation measures" is **not exhaustive**.

The air operator will have to assess whether these proposed elements are relevant and effective. In no case, the proposed elements pretend to be sufficient or be the right approach to control the risks to an acceptable level.

There is no full risk assessment proposed as such: the comprehensive risk assessment for each identified hazard and consequently the determination of the needed mitigation measures, remain the ultimate responsibility of the air operator, as the context may widely vary from one airline to another.

It can be also useful to consider the other EASA-developed scenarios, which provide with a different list of hazards adapted to the nature of the scenario, but may remain a source of inspiration.

The national competent authorities can also use these guidelines in the course of their surveillance activities.

Comments, suggestions and improvement can be addressed to safety.management@easa.europa.eu.

2. Desciption of the practical scenario

Context:

This scenario applies to air operator's crews with limited or no recent experience and with limited exposure to training that, after a long period (beyond 6-12 months) of inactivity, return on duty.

Every crew member is supposed to apply, during his/her duty, nine competences. These are:

- Application of knowledge;
- Application of procedures;
- Communication;
- Use of automation (aeroplane flight path management);
- Manual flying skills (aeroplane flight path management);
- Leadership and teamwork;
- Decision making/Problem solving;
- Situational awareness;
- Workload management.

These competences will suffer a different level of decay based on how long the crew member has not used them.

Application of knowledge

The "Decay Theory" suggests that if someone does not access or use knowledge he/she has learned, it will slowly decay over time. The risk today, after a long period where the knowledge had not been used, is that the crew member will forget it. There can be numerous reasons why crew forget what they've learnt; however, the main one is because they don't have the opportunity to apply what had been learnt.

<table>
<tr><th>AREA</th><th colspan="3">APPLICATION OF KNOWLEDGE</th></tr>
<tr><th>THREAT</th><th>HAZARD</th><th>CONSEQUENCES</th><th>MITIGATIONS</th></tr>
<tr><td colspan="4">FLIGHT CREW</td></tr>
<tr><td rowspan="3">Reduced flight activity and training exposure

Explanation: flight crew, due to the reduced exposure, to the operational environment may forget operational requirements and limitations of the specific approvals</td><td>Aircraft specific Knowledge decay</td><td>- Forget aircraft and system limitations
- Reduced system knowledge</td><td rowspan="3">- Amend the ground training before Flight Crew return to fly to address the identified hazards.
- Give unlimited access to CBT material to allow Flight Crew to refresh their knowledge on aircraft specific topics
- Introduce a ground training refresher to address the return to operation
- Increase the number of standardization meetings for instructors Flight Crew (Ground instructor, Line Training Captain, Type Rating Instructor and Type Rating Examiner)
- Introduce a crew rostering practice avoiding the pairing of pilots both with long periods of reduced flight activity</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Operational Knowledge decay</td><td>Reduce adherence to the operational requirements for:
- Performance Based Navigation
- Low Visibility
- ETOPS
- MNPS</td></tr>
</table>

AREA	APPLICATION OF KNOWLEDGE		
THREAT	**HAZARD**	**CONSEQUENCES**	**MITIGATIONS**
CABIN CREW			
Reduced flight activity Explanation: cabin crew, due to the reduced exposure to the operational environment, may forget operational procedures	**Operational Knowledge decay**	Reduce adherence to SOP normal and non-normal (i.e. normal procedure arm and disarm slides, passengers)	- Introduce a ground refresher training before Cabin Crew return to fly - Give unlimited access to CBT material to allow Flight Crew to refresh their knowledge on aircraft specific topics - Develop a handout to refresh Cabin Crew knowledge - Increase the number of standardization meetings for instructors Flight Crew and Cabin Crew (Ground instructor and Cabin Crew line trainers)

Application of procedures

The notion of skill degradation and skill decay in highly procedural workplaces such an aircraft cockpit is widely known to be a side-effect of automation. With time, and without rehearse or refresh of the acquired knowledge and skill, performance declines. This skill degradation is observed in an increased response time or decreased accuracy of the performed tasks.

AREA	**APPLICATION OF PROCEDURES**		
THREAT	**HAZARD**	**CONSEQUENCES**	**MITIGATIONS**
FLIGHT CREW			
Reduced flight activity Explanation: Flight Crew, due to the reduced exposure to the operational environment, may lose confidence on operational procedures knowledge. This may have an impact on situational awareness.	**Lapses and errors applying SOP**	- Exceeding operating limits (Max flap speed, MMO, Max extended gear speed) - Unstable approaches - Disrupted flow pattern - Incorrect A/C configuration - Increased workload - Confusion - Wrong prioritization of tasks - Use of wrong checklist	- Develop a video to use as refresher training to review preflight procedures and cockpit preparation - Prepare a handout to be used by pilot to review the cockpit preparation and the preflight - Adapt the ground training refresher content to reflect the current pilot situation - Introduce a CRM recurrent oriented to long break period/absence from flight activity - Introduce a crew rostering practice avoiding the pairing of pilots both with long periods of reduced flight activity
	Inadequate cockpit preparation and	- Wrong entries on FMS during pre-flight - Errors in performance calculation - Errors in W&B calculation - Poor pre-flight briefing - Wrong aircraft configuration (i.e. pitot	

AREA	APPLICATION OF PROCEDURES		
THREAT	**HAZARD**	**CONSEQUENCES**	**MITIGATIONS**
	pre-flight procedure	cover or landing gear pins not removed, not all covers / doors safely fastened)	
	SOP knowledge decay	Reduce adherence to SOP normal and non-normal	
	Possible conflicting information between current and old procedures (SOPs, OMA, OMD etc.)	- Workload - Confusion - Wrong prioritization of tasks - Unclear communication between the pilots - Wrong task sharing	

AREA	APPLICATION OF PROCEDURES		
THREAT	**HAZARD**	**CONSEQUENCES**	**MITIGATIONS**
CABIN CREW			
Reduced flight activity Explanation: Cabin Crew, due to the reduced exposure to the operational environment, may lose confidence on operational procedures. This may have an impact on situational awareness.	**Lapses and errors applying SOP**	- Open doors with slide armed - Wrong prioritization of task - Misleading communication with flight crew - Wrong task sharing	- Develop a video to use as refresher training to review preflight procedures and cabin preparation - Prepare a handout to be used by Cabin Crew to review the cabin preparation and the preflight procedures - Introduce a CRM training session oriented to long break period/absence from flight activity

USE OF AUTOMATION AND MANUAL FLYING SKILL

AREA	USE OF AUTOMATION AND MANUAL FLYING SKILL		
THREAT	**HAZARD**	**CONSEQUENCES**	**MITIGATIONS**
Reduced flight activity Explanation: Flight Crew, due to the reduced exposure to the operational environment, may lose confidence on the use of automation and/or manual flying skills.	**Lapses and errors using aircraft automation**	- Exceeding operating limits (Max flaps speed, MMO, Max extended gear speed) - Unstable approaches - Increased workload - Confusion - Wrong prioritization of tasks	- Introduce a crew rostering practice avoiding the pairing of pilots both with long periods of reduced flight activity - Add an additional FSTD session for Line Training Captains and possibly for all pilots. - Increase the number of standardization meetings for instructors Flight Crew (Ground instructor, Line Training Captain, Type Rating Instructor and Type Rating Examiner) - Use of a Safety Pilot for the first few legs for any Copilot with reduced experience (i.e. Flight Crew that had their training interrupted) - Amend the OPC syllabus to focus on manual skills, raw data and use of automation - Add LIFUS sectors to pilots with limited experience
	Difficulties in maintaining the flight path in manual flight	- Unstable approach - ILS excessive deviation - Hard landing - Long landing - Aircraft limitation exceeded - Increase workload - Confusion	

EASA
European Union Aviation Safety Agency

Practical scenario 2

Note: this document complements the core guidelines on the "role of operators' management systems in the COVID-19 recovery phase".

Revision record

Issue	Date of issue	Summary of changes
01	17.07.2020	Initial issue

1. Foreword

The scenario mainly addresses the air operators, when identifying and addressing the safety hazards associated with the return to normal operations (RNO) following the COVID-19 pandemic.

The practical scenario has been developed with the support of subject-matter experts from air operators, international associations and national competent authorities.

From a safety risk management's perspective, the scenario only provides guidelines for consideration.

The list of "hazards", "threats", "consequences" and "mitigation measures" is **not exhaustive**.

The air operator will have to assess whether these proposed elements are relevant and effective. In no case, the proposed elements pretend to be sufficient or be the right approach to control the risks to an acceptable level.

There is no full risk assessment proposed as such: the comprehensive risk assessment for each identified hazard and consequently the determination of the needed mitigation measures, remain the ultimate responsibility of the air operator, as the context may widely vary from one airline to another.

It can be also useful to consider the other EASA-developed scenarios, which provide with a different list of hazards adapted to the nature of the scenario, but may remain a source of inspiration. For instance, this scenario does not address the risks of limited Ground Handling Service Provider services at the destination or flights to airports just re-opening , which have been actually addressed by "practical scenario 1".

The national competent authorities can also use these guidelines in the course of their surveillance activities.

Comments, suggestions and improvement can be addressed to safety.management@easa.europa.eu.

2. Desciption of the practical scenario

Context:

This scenario applies to an air operator restarting their usual types of operations with the need to review its business model during the return to normal operations.

Explanation:

- A charter / CAT air operator is resuming its standard point to point activity.
- Since the activity is still limited, the air operator decides to fly cargo transportation in passenger cabin to increase the commercial offer.
- All the organizational areas within the air operator will be affected by the change.
- Due to the limited activities, part of the airline staff are on unpaid leave and the crew are selected on a rotating basis.
- Only minimum staff are available

3. Proposed list of identified hazards with hyperlinks

Instructions: activate the hyperlinks to access the proposed "threats", "consequences" and "mitigation measures" for each hazard listed below

From an ORGANISATIONAL perspective

- Staff psychological stress
- Inadequate management of change following introduction of a new business
- Reduction of safety resources

From FLIGHT OPERATIONS perspective

- Flight Crew (Cockpit & Cabin) with reduced recent experience
- Insufficient number of pilots and cabin crew to cope with demand
- Non adherence to SOP
- Reduced reporting of safety issues and non-compliances
- Crew not familiar with cargo operations during flight preparation
- Improper operational measures for Covid-19 during passenger flights
- Inadequate introduction of new SOP for Cargo transport in cabin

From a TRAINING perspective

- Insufficient crew training staff availability during the restart of operations
- Insufficient crew training planning considering the new business plan
- Training department with limited volume of activities in the last 6 months
- Inadequate training on new procedures (SOP) for cargo transport in cabin

From an OPERATION CONTROL CENTER's and CREW SCHEDULE DEPARTMENT perspective

- Inadequate crew rostering
- Reduced staff
- OCC and Crew Scheduling department with reduced recent experience
- Inadequate training of OCC/Crew Scheduling and other air operator staff about new SOP's

From the GROUND DEPARTMENT perspective

- Not all ground staff and service is available from external parties

- Inaccurate loading procedure
- Sanitary procedures not followed by the GHSP staff

From a CAMO and MAINTENANCE perspective

- Insufficient maintenance planning
- Lack of availability of maintenance and engineering staff (internally or third party)
- More time needed for maintenance inspection(s)
- Limited availability of maintenance staff
- Reduced size of the CAMO
- Prolonged period of parking (long storage)

AREA	ORGANISATIONAL (Staff wellbeing, Commercial & financial pressure, etc.)		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Job instability/uncertainty Financial distress	**Staff psychological stress**	Staff and crew (un)well-being Psychological pressure Errors / lapses Fatigue Diminution of alertness Increased risk-taking	Explanation: During the period of unprecedented job instability and cost-savings, staff are facing psychological pressure and stress with possible consequences on their safety performance. Productivity gains from crews will involve extending maximum working hours allowed in a duty period, reducing rest periods during duties. Overhaul of pay and benefits may be central. Mitigation: - Clear communication with the staff on airline strategy (business recovery plan): it is important that there is a robust and centrally coordinated communication strategy in place to prevent rumor and misinformation that will create more uncertainty and stress. Such communication should provide up to-date and reliable information to employees and customers. - Staff resource plan timely adapted to the short, mid and long term operation outlook - Access to mental wellbeing support programs such as pilot peer support (see EPPSI[1]) – see also Commission Regulation (EU) 2018/1042[2] - Direct Management Contact with Staff highlighting the importance of the safety and wellbeing of all colleagues as a top priority and outlining the employee supports available (e.g. Employee Assistance Programmes (EAP). - Remind the employees of the organisation's Just Culture

[1] European Pilot Peer Support Initiative at http://eppsi.eu/

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1591935555034&uri=CELEX:32018R1042

AREA	ORGANISATIONAL (Staff wellbeing, Commercial & financial pressure, etc.)		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Financial distress	**Inadequate management of change following introduction of a new business**	Ineffective identification of critical area Poor review of airline documentation Poor planning Non compliances Insufficient resources	Explanation: Following the decision to change the business model an air operator should develop a robust management of change in order to early identify areas that will need more attention during the implementation phase. Mitigation: - Develop a management of change - Involve all the department in the management of change exercise - Perform a gap analysis to identify the critical areas

AREA	ORGANISATIONAL (Staff wellbeing, Commercial & financial pressure, etc.)		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress	**Reduction of safety resources**	Reduced effectiveness of safety and compliance staff / department Ineffective monitoring of management system key processes such as the hazard identification and risk assessment process. Backlog in audit plan / decreased performance Dismissal or furlough of key staff Loss of competence due to cost-saving measures Increased workload due to COVID-19 management of change activities (downsizing, COVID-19 contingency measures, re-start of operations)	Explanation: During the commercial and financial difficulties, air operators may be tempted to significantly cut the resources in the whole organisation. Safety and compliance may be affected by these cost-saving measures. Organisations have to rely on safety and compliance monitoring function during the critical phases of the re-start. Therefore organisations should avoid any cost-saving measures in this area. Mitigation: - Clear business plan to restart operations and manage changes considering short/medium/long term communication; transparency on the recovery plan towards all employees and towards the overseeing authorities - Identification of critical tasks and prioritization of tasks - Strengthen safety and compliance monitoring capabilities - Adapt the frequency of the SRB meeting and SAG if appropriate - Procedure to monitor the wellbeing of staff / cell where to report any concerns in an anonymous and non-punitive (sanction-free) manner - Promote internal (just) reporting culture to facilitate the identification of possible negative safety trends - Compliance is paramount

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Staff unemployed following a rotation scheme	**Flight Crew (Cockpit & Cabin) with reduced recent experience**	Degradation of Handling Skills Exceeding operating limits (Max flap speed, MMO, Max extended gear speed) Unstable approaches Handling errors Disrupted Flow Pattern Runway excursion Tail strike (during take-off and/or landing) Hard landing upset Recovery skills incorrect A/C configuration Error in performance calculation	Explanation: The air operator, due to cost-saving policiesand reduction of activities, may have opted for having crew employed on a rotation scheme [e.g. one month on duty and one month furloughed). This may have had an impact on pilot flying skills. Mitigation: - Consideration should be given for pilots with limited flying experience should be given when considering training requirements before returning to duty after inactivity. - Consider developing specific briefings for LTCs and TRIs during RNO to address specific reduced experience-related issues. - Avoid any amendment to SOP during the crew rotation scheme periods. - Roster, when possible, crew with recent flying / duty activity - Consider the possibility to plan the roster of pilot returning on duty after furlough with a line training captain or a TRI - Consider the possibility to plan the roster of cabin crew returning on duty after furlough with a cabin trainer or with an experienced in-charge crew member. - When there is no option available other than rostering together crew after returning from furlough, consider applying operational limitations [e.g. reduction of maximum crosswind component, increased operational minima etc.]

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Staff unemployed following a rotation scheme Financial distress Aggressive cost-saving policy	**Insufficient number of pilots and cabin crew to cope with demand**	Inadequate crew pairing Fatigue Inadequate rest Greater pressure to 'pass' pilots during test or simulator sessions Delay or Flight cancelation Commercial pressure on the crew	Explanation: Many organizations may have opted to furlough pilots and cabin crew on a rotation scheme. As demand picks up quicker than anticipated, there will be increased strain on available resources. Mitigation: - Clear business plan to restart operations and manage changes considering short/medium/long term communication accompanied by transparency for the employees and the overseeing authority with respect to all elements of a recovery plan - Consider crew pairing and adequate rostering - Monitor the different stages of the pandemic and review the business plan in a dynamic manner.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Non-adequate communication on documentation changes	**Non adherence to SOP**	Exceeding operating limits (Max flap speed, MMO, Max extended gear speed) Unstable approaches Disrupted Flow Pattern Runway excursion Tail strike (during T/O and/or landing) Hard landing incorrect A/C configuration Error in performance calculation Rush pre flight Unsafe decision making Take off abort Ineffective CRM Poor communication between crew leading to errors	Explanation: Due to commercial pressure induced by the current situation or self-induced by the pilots, the strict adherence to SOP may be jeopardized. The non-adherence to SOP may also be generated by poor organisational communication on changes in the documentation. Mitigation: - Monitor SOP adherence of crew with FDM to early capture negative trends that may lead to occurrences with safety impact - Ensure that the way the organisation communicates with the staff does not create a self-induced commercial pressure needs - Verify that official manuals have been amended to include latest revisions and staff receive adequate information or training - Make sure that training staff verifies adherence to SOP during training sessions

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Job insecurity / instability Negative just culture Lack of management commitment	**Reduced reporting of safety issues and non-compliances**	Ineffective organisation (S)MS Undetected damages / exceedance [flap overspeed; hard landing etc.]	Explanation: Due to the current situation of financial distress and job instability, experience demonstrates that crew willingness to report events is impaired and outweighed by the fear of negative repercussion. An effective management system relies on a good reporting culture to collect occurrences and identify negative trends. Mitigation: - Monitor reporting trends compared to other means of collecting safety data [e.g. FDM] to early detect negative trends in pilot reporting culture; - Ensure that the level of trust to the organisation among the crew on reporting remains at the expected level supported by an appropriate communication approach and commitment by the senior management. - Remind the employees of organisation's Just Culture principles, including protection of the reporter and no sanctions for reporting - Remind the employees of the Regulation (EU) No 376/2014 on reporting, analysis and follow-up of occurrences in civil aviation, including fatigue as mandatory reporting item, and encourage them to report. - Senior management shall re-enforce the just-culture measures, considering the current situation.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New business model not properly communicated. New procedures not adequately implemented Lack of crew experience on transportation of cargo	**Crew (cockpit &cabin) not familiar with cargo operations during flight preparation**	Wrong fuel decision Not realizing possible mistakes in flight planning/calculation Cargo not properly secured Cargo not properly checked before commencing the flight Incorrect A/C configuration Load sheet errors Loading instructions not clearly defined and notified to the crew Position of extra emergency equipment not clearly marked Cabin crew duties during cargo flight not clearly defined Inadequate A/C preparation Ineffective walkaround Take off abort Uncertainty about declaration/status of A/C (passenger or cargo A/C) and respective Dangerous	Explanation: Following the airline's decision to adopt a new business model, the crew may lack necessary experience on transportation of cargo. Moreover, the current situation may reduce the possibility to deliver appropriate training and the required implementation of procedures. Mitigation: - Air operators may consider reviewing the time allocated for the flight preparation and briefing - Air operators have to amend procedures to adapt to the new business activity - Air operator may consider the need for a refresher course on dangerous goods and cargo, when relevant. - Ensure that the crews are familiar with the new extra emergency equipment's location. - Ensure that the ground staff are familiar with the weight & balance as well as ground procedures. - Ensure adequate crew information package specifying applicable operation/regulation

		goods regulation to be applied (e.g. dangerous goods Cargo A/C only)	

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Covid-19 New or additional COVID-driven procedures (e.g. specific announcements, use of PPE, Sanitation requirements)	**Improper operational measures for Covid-19 during passenger flights**	Aircraft contaminated with infectious disease. Below standard execution of procedures Unruly passenger Crew health safety being impaired Additional workload Confusion Fatigue stress leading to lapses and errors	Explanation: The air operator may have not implemented in the most effective way the procedures to cope with the pandemic due to the highly changing situation. Mitigation: - Additional cleaning requirements - Procedures and provision of anti-bacterial hand wipes and surface wipes to clean & pre-prepare all contact surfaces or any other sanitary means - Air operator shall verify the appropriateness of procedures for staff to access the aircraft during turnaround. - The air operator may review the “unruly passenger” policy and procedure to better address the additional COVID-19 peculiarities. - consider EASA /ECDC Aviation Health Safety Protocol[3]; latest revision of SIB 2020-025; and the EASA guidance on “Management of crew members” and “Aircraft cleaning and disinfection”

[3] https://www.easa.europa.eu/newsroom-and-events/news/passenger-health-safety-updated-measures-summer-2020

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Cargo transportation: Unfamiliar new type of operation (cargo) Improper introduction of new policies and procedures	**Inadequate introduction of new SOP for cargo transport in cabin**	Crew confusion on task allocation Unsafe transportation of cargo Below standard execution of procedures Errors Inadequate CRM Increased workload Cabin Crew duties not clearly defined , cabin crew not specifically trained for emergency procedures (e.g. firefighting) in cargo configuration	Explanation: Due to time pressure, the air operator may not have properly implemented and distributed procedures on cargo transportation. Mitigation: - Ensure proper communication with the crews to highlight the new procedures related to transport of cargo - Ensure that the crew (cockpit & cabin) receive the proper training -

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Restart Operation: Lack of, or reduced training crew (instructors/examiners) (Resource Management HFACS)	**Insufficient crew training staff availability during the restart of operations**	Unavailability of crew Delay in the implementation of the training plan Cancelation of training events Decreased training efficiency Reduced effectiveness of training Unsafe aircraft operations Fatigue and increased stress for pilots who fly	Explanation: Due to the cost-saving policy and the inadequate plan of activities, the air operator may face a reduction of training staff availability. This may have an impact on the timely delivery of training. Mitigation: - Review the training programme to evaluate the number of trainers needed to deliver the training needs in a timely manner. - Review the operational needs to ensure that the impact of reduced training capability will not negatively affect the pilots currently qualified for the operations - Ensure the prioritization of training based on the operational needs

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Inadequate business plan implementation	**Insufficient crew training planning considering the new business plan**	Lack of trained crews Difficulties in implementing the new business plan and demands The senior management may generate pressure to meet business plan Insufficient instructors availability Non availability of third party training providers/simulators Degradation of crew training standards	Explanation The air operator may have not properly evaluated the consequences of the new business plan on the crew training needs. Mitigation - Review the planning and assess the operational impact [assess the number of trained pilots needed]; - Ensure the prioritization of training based on the operational needs for the new business plan - Consider new training service providers Amend the crew training planning and subsequently the programme to ensure the availability of trained crew to perform the expected flights

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Covid-19	**Training department with limited volume of activities in the last 6 months**	Ineffective training Ineffective evaluation of trainee's performance Inappropriate use of the grading system	Explanation: The Covid-19 situation and the consequent reduced flight activity impact the training department, reducing significantly the training activities Mitigation: - Air operator may consider introducing a refresher and standardization training for all the instructors during the restarting phase - Air operator may consider reviewing its training grading system and perform an instructor's refresher course

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Introduction of new procedures with limited training resources New type of operation (cargo) requirements and restrictions, policy (SOP's), destination (s)	**Inadequate training on new procedures (SOP) for cargo transport in cabin**	Inappropriate training of instructors Inadequate training of crew (cockpit & cabin) Below standard execution of procedures and confusion. Crew and staff confusion Errors	Explanation: With the introduction of new business activities a need for training is foreseen. Following the significant reduction of operational and training activities and the inability to perform classroom training some of the new procedures may have not been trained properly. Moreover, instructors may have not received appropriate training on new SOP. Mitigation: - Air operator may consider to introduce a refresher and standardization training for all the instructors during the restarting phase - Refresh training to all crew involved in the new type of operation

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Restart Operation: Lack of, or reduced number of crew	Inadequate crew rostering	Crew exceed FTL limitation Crew fatigue Unsafe aircraft operation Flight delay Flight cancelled Increase in FDP, use of exemptions	Explanation: Cost-saving measures and reduced activity may have affected the availability of crew during the restart phase. This may have an impact on the correct and safe execution of a flight. Mitigation: – Air operator to review the rostering procedure to ensure an efficient & safe management of crew as well as mitigate fatigue – Air operator to enhance its Fatigue Risk Management (FRM) processes & set up / involve the Fatigue Safety Action Group (FSAG) – FTL limitations to be fully applied by the operator (= as a basic line of defence to underpin FRM) – Operator to encourage crew to report fatigue to allow detecting fatigue hazards & set up mitigations

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure / labor laws (e.g. short time work regulations)	**Reduced staff**	Inaccurate flight planning, including route, fuel, and alternate planning (e.g. firefighting capacity required might have changed) No update information Error Erosion of experience High workload as demand picks-up Fatigue and crew fatigue	Explanation: Cost-saving measures may affect all staff, including OCC staff and Crew schedule department. This may affect the quality of the flight planning and flight preparation and ultimately safety. Mitigation: - Plan the flight considering contingency plan – on several levels and for different scenarios. - Develop specific GM / Check-Lists / What-to-do Lists for every scenario and train the crews on the way those should be applied. - Organise a special team of experts available for the Crews for instant remote contact – with a task to support the crews - especially if those crews are already in the air. - Plan to restart the operations on a step-by-step basis. Plan enough time for Q&A. Try to learn on every occasion what is hampering the new developed SOPs – what is working and what is not. - Crew scheduling: enhance Fatigue Risk Management (FRM) processes, set up / involve the Fatigue Safety Action Group (FSAG), encourage reporting.

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Restart operations: Reduce flight activity Staff unemployed scheme	**OCC and Crew Scheduling department with reduced recent experience**	Inaccurate flight planning, including route and fuel No update information Error Uncertainty about declaration/status of A/C (passenger or cargo A/C) and respective Dangerous goods regulation to be applied (e.g. dangerous goods Cargo A/C only)	Explanation: Due to the reduced flight activity during the recent months there could be a higher probability of errors in OCC and scheduling department. Mitigation: - Review planning and rostering procedure to verify adequacy during the restart of operation - Monitor quality of flight planning and crew rostering to early identify negative trend - Enhance Fatigue Risk Management (FRM) processes, set up / involve the Fatigue Safety Action Group (FSAG), encourage reporting. - Develop clear guidance and respective OCC training

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Cargo transportation: New type of operation (cargo) requirements and restrictions, policy (SOP's), destination	**Inadequate training of OCC/Crew scheduling and other operator staff about new SOP's**	Inaccurate flight planning Error Inaccurate performance calculation Stress Wrong Operational Flight Plan Increased number of diversion Increased flight time Inappropriate ATC clearance Inaccurate fuel planning Wrong NOTAM Aerodrome closed Missing airspace restriction Wrong Flight Plan Inaccurate flight envelope preparation Uncertainty about declaration/status of A/C (passenger or cargo A/C) and respective Dangerous goods regulation to be applied (e.g.	Explanation: Due to the reduce capability of the training department OCC staff may not have received adequate training on the new type of operation or the new procedures. Mitigation: - Organize a dedicated training before the start of operation - Review adequacy of documentation and information provided to OCC and Crew rostering staff

		dangerous goods Cargo A/C only)	

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Restart Operation: Airport and ground handling staff reduction	**Not all ground staff and service is available from external parties**	Flight Delay Flight Cancelations Loading error Cargo securing error Loadsheet error Concern that ground handling providers or airport operators, will return to operations with reduced safety margins. Security breach Ramp safety event Necessary ground equipment (loading) not available	Explanation: Non or limited service/support is available. In addition large turnover of GH SP staff is well known Mitigation: - Air operator has to consider possible contingency situation during flight planning. - Consider to perform a remote inspection [at least desk-top review of manuals and procedures] of the GH SP (oversight of the subcontracted activities) - Air operator has to identify the significant changes affecting the GH SP.

AREA	**GROUND**		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New procedures New type of operation(s) Inadequate introduction of new SOP's for Cargo transport in cabin Inadequate training of new SOP's for Ground staff	**Inaccurate loading procedure**	Degradation in aircraft performance/out of trim condition Tail strike (TO and landing) Runway overrun Cargo not secured Cargo shift	Explanation: Due to the introduction of new types of operations or new configuration of the aircraft, ground handling can be impacted. Mitigation: - Amend ground operation manual procedures - Ensure proper equipment available at destination. - Contact destination aerodrome / airport and all subcontractors there before the flight - Monitor / check the cargo loading of the aircraft - Deliver adequate training

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Spread of Covid19 Extra ground operational measures for Covid-19	**Sanitary procedures not followed by the GHSP staff**	Aircraft contaminated with infectious disease.	Explanation: Groun Handling Service Provider (GHSP) may have procedures different with the ones of the air operator to cope with the pandemic. Mitigation: - Additional cleaning requirements; consider EASA Safety Directives 2020-03[4] and 2020-04[5] - Verify the adequacy of the air operator's procedures with the GHSP - Consider EASA /ECDC Aviation Health Safety Protocol[6]; latest revision of SIB 2020-025 ; and the EASA guidance on "Management of crew members" and on "Aircraft cleaning and disinfection"

[4] https://ad.easa.europa.eu/ad/SD-2020-03
[5] https://ad.easa.europa.eu/ad/SD-2020-04
[6] https://www.easa.europa.eu/newsroom-and-events/news/passenger-health-safety-updated-measures-summer-2020

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Staff unemployed scheme Cash flow out (Organisational process)	**Insufficient maintenance planning** **Lack of availability of maintenance and engineering staff (internally or third party)** Maintenance staff not familiar with cargo in passenger Airplane requirements/retrofits (could be a threat in its own)	Lack of maintenance oversight or execution Flight cancelation or delay Unsafe flight operation (aircraft in non-airworthy condition) Overdue maintenance tasks No or delayed parts or tooling availability Postponing maintenance tasks Maintenance actions /issues necessary in the cabin are overlooked/unknown leading to not airworthy aircraft	Explanation: Due to the cost-saving policy, the air operator's staff have been laid-off or furloughed. The lack of human resources (CAMO) impact the maintenance planning of the fleet. In addition, externally, the lack of resources with the contracted AMOs (Base and line maintenance as well as maintenance sub-contractors at the destination) impacts the planning of the maintenance tasks as well as the support for the engineering preparation of the maintenance work package(s) Mitigation: - The air operator has to review its procedures for maintenance planning to allow more time and adequately address any safety issues that may hinder the airworthiness of the fleet. - The air operator must ensure continuous line of communication with the maintenance entities providing engineering support to better schedule the maintenance slots and the nature of the maintenance tasks - Clear business plan to restart operations and manage changes considering short/medium/long term communication; transparency on the recovery plan towards all employees and towards the overseeing authorities - Ensure clear and amended maintenance documentation to reflect the changed configuration requirements - Ensure appropriate maintenance staff training

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Reduced staff Lack of qualified personnel High number of engineering qualification overdue HF impact on Line or base Maintenance department due unforeseen workload Time pressure Psychological pressure and wellbeing High number of aircraft have been stored. Some on them have been parked away from the availability of a maintenance organisation	**More time needed for maintenance inspection(s)**	Aircraft not airworthy Damage or failure not detected or fixed Aircraft engaged beyond technical limits or not properly trouble-shooted Possible triggering of real or spurious warnings and indications Unclear technical status Significant number of deferred defects and open MEL items Delay Backlog of Aircraft Maintenance Programme (AMP) tasks Airworthiness exemptions (such as AMP tasks extension or ARC validity) Errors due to time or psychological pressure Flight Crew could be unaware of the fact that aircraft is not airworthy	Explanation: Because the aircraft did not fly for a long period of time, the number of maintenance tasks and inspections needed to re-store the aircraft back to operations will be higher and a longer time to complete them will be necessary. The nature of the inspections could be also altered. Unavailability of spare parts may impact the delivery of the aircraft. Mitigation: - Sufficient time should be given to the CAMO to re-assess the airworthiness status of the aircraft, especially when re-engaging the aircraft after de-storage and prepare the maintenance package for the Aircraft Maintenance Organisation(s) (AMO). - CAMO should plan sufficient time to let the AMO carry-out the maintenance package, keeping in mind that the de-storage of the aircraft will reveal defects, which will impact the duration of the maintenance check. CAMO and AMO should anticipate the availability of spare parts. - Coordination between the OCC, the CAMO and the AMO should be ensured to better plan the availability of the aircraft for the air operations. - The airworthiness status of the aircraft should be carefully followed-up and passed to the OCC for the flight preparation so that the crew are fully aware of the aircraft status, defects and open MEL items before (re)starting air operations - The OCC and CAMO in liaison with the AMO should double check the airworthiness status and the release to service of the aircraft with a

			special attention to the defects found during the checks or incomplete tasks. - Ensure adequate maintenance contract(s) and maintenance capabilities at the aerodrome where the aircraft has been stored. - Ensure that the availability and capability of maintenance organisations at the destination.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Maintenance providers limit supported locations Financial distress of the maintenance organisations	**Limited availability of maintenance staff**	Aircraft in AOG Cancellation or delay of flights Commercial pressure to operate the aircraft with deferred items Extensive use of MEL Repair interval extension	Explanation: Air operators may face difficulties with the maintenance service provider that had to reduce the number of staff due to the consequences of the pandemic. Mitigation: - Establish a communication line with the maintenance providers to understand their capability to cope with the maintenance needs and plan aircraft use in coordination with the OCC - Prepare a contingency plan - Make sure that the crew clearly understands their remit and privileges related to the MEL items and associated maintenance actions. - Check the robustness of an internal policy on the dispatch of aircraft with open MEL. - Ensure the monitoring and analysis of repetitive defects by the CAMO in order to be proactive in the identification of possible hazards

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress	**Reduced size of the CAMO**	Possible overruns on maintenance tasks Overdue Airworthiness Directive(s) (AD) or missed AD Inappropriate management of maintenance tasks and airworthiness status of the fleet Not appropriate evaluation and follow-up of technical log book entries Lack of competence due to laid-off personnel	Explanation: Due to the cost-saving policy, the air operator may decide to reduce the size of the CAMO to the minimum. Mitigation: - The air operator shall analyse the impact of this staff reduction and develop a robust procedure to ensure the airworthiness of the aircraft. - The air operator should develop an effective mapping of CAMO staff competences in order to ensure the continuing airworthiness monitoring function. - The air operator and its CAMO should ensure an effective line of communication with the maintenance organisation for a better coordination about the maintenance actions to take

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Reduce operational activity	**Prolonged period of parking (long storage)**	Degraded aircraft systems; numerous defects; operations with multiple open MEL items Aircraft in AOG; unavailability of spare parts Commercial pressure to operate the aircraft with deferred items Unknown failure of emergency or critical systems Clogged pitots, landing gear bay, APU exhausts, other Vents/Orifices damaged by wildlife Undetected damages to a/c systems such as leaking actuators, sealing, structure-'Sticky' Valves, Dried-Out Seals, Avionic faults, corrosion of metals etc. Low or high rejected T/O Unreliable high speed event In-flight failures. Spurious alarms	Explanation: The aircraft may have been parked for a long time. During prolonged parking, aircraft may have been damaged. These damages may have not been reported to the air operator. Because the aircraft did not fly for a long time, the number of maintenance tasks and inspections needed to re-store the aircraft back to operations will be higher and a longer time to complete them will be necessary. The nature of the inspections could be also altered. Unavailability of spare parts may impact the delivery of the aircraft Mitigation: - Sufficient time should be given to the CAMO to re-assess the airworthiness status of the aircraft, especially when re-engaging the aircraft after de-storage and prepare the maintenance package for the Aircraft Maintenance Organisation(s) (AMO). - CAMO should plan sufficient time to let the AMO carry-out the maintenance package, keeping in mind that the de-storage of the aircraft will reveal defects, which will impact the duration of the maintenance check. CAMO and AMO should anticipate the availability of spare parts. - As regards to exemptions: the air operator should avoid the compounding effect of cumulative exemptions granted in other domains [airworthiness exemptions with exemptions related to the lack of crew's recent experience]. Plan carefully the crew pairing. - The OCC and CAMO in liaison with the AMO should double check the airworthiness status and the release to service of the aircraft with a special attention to the defects found during the checks or incomplete tasks.

		Increase of workload for the pilots Fuel contamination Flight Crew could be unaware of the fact that aircraft is not airworthy AMP not adapted to the utilization of the fleet; reliability programme not anymore relevant.	- Ensure adequate maintenance contract(s) and maintenance capabilities at the aerodrome where the aircraft has been stored. - Ensure that the availability and capability of maintenance organisations at the destination. - The air operator has to develop a robust procedure to ensure that, after prolonged parking, the quality of fuel must be checked before the first next flight. In addition, with the possible contamination of fuel tanks at the aerodrome, the procedure can be extended to the following flights. - Review the adequacy of the AMP tasks and their frequency. - Consider the need for a test flight.

USE OF AUTOMATION AND MANUAL FLYING SKILL

AREA	USE OF AUTOMATION AND MANUAL FLYING SKILL		
THREAT	**HAZARD**	**CONSEQUENCES**	**MITIGATIONS**
Reduced flight activity Explanation: Flight Crew, due to the reduced exposure to the operational environment, may lose confidence on the use of automation and/or manual flying skills.	**Lapses and errors using aircraft automation**	- Exceeding operating limits (Max flaps speed, MMO, Max extended gear speed) - Unstable approaches - Increased workload - Confusion - Wrong prioritization of tasks	- Introduce a crew rostering practice avoiding the pairing of pilots both with long periods of reduced flight activity - Add an additional FSTD session for Line Training Captains and possibly for all pilots. - Increase the number of standardization meetings for instructors Flight Crew (Ground instructor, Line Training Captain, Type Rating Instructor and Type Rating Examiner) - Use of a Safety Pilot for the first few legs for any Copilot with reduced experience (i.e. Flight Crew that had their training interrupted) - Amend the OPC syllabus to focus on manual skills, raw data and use of automation - Add LIFUS sectors to pilots with limited experience
	Difficulties in maintaining the flight path in manual flight	- Unstable approach - ILS excessive deviation - Hard landing - Long landing - Aircraft limitation exceeded - Increase workload - Confusion	

EASA
European Union Aviation Safety Agency

Scenario 1

Note: this document complements the core guidelines on the "role of operators' management systems in the COVID-19 recovery phase".

Revision record

Issue	Date of issue	Summary of changes
01	17.07.2020	Initial issue

1. Foreword

The scenario mainly addresses the air operators, when identifying and addressing the safety hazards associated with the return to normal operations (RNO) following the COVID-19 pandemic.

The scenario has been developed with the support of subject-matter experts from air operators, international associations and national competent authorities.

From a safety risk management's perspective, the scenario only provides guidelines for consideration.

The list of "hazards", "threats", "consequences" and "mitigation measures" is **not exhaustive**.

The air operator will have to assess whether these proposed elements are relevant and effective. In no case, the proposed elements pretend to be sufficient or be the right approach to control the risks to an acceptable level.

There is no full risk assessment proposed as such: the comprehensive risk assessment for each identified hazard and consequently the determination of the needed mitigation measures, remain the ultimate responsibility of the air operator, as the context may widely vary from one airline to another.

It can be also useful to consider the other EASA-developed scenarios, which provide with a different list of hazards adapted to the nature of the scenario, but may remain a source of inspiration.

The national competent authorities can also use these guidelines in the course of their surveillance activities.

Comments, suggestions and improvement can be addressed to safety.management@easa.europa.eu.

2. Desciption of the scenario

Context:

This scenario applies to CAT air operators that re-engage their aircraft after a long period of storage or/and with crew with limited or no-recent experience to an aerodrome that was recently re-opened to traffic.

Explanation:

- Operation of a flight with the aircraft coming from mid-term storage and crew with no or few activity in the last 3 months.
- The air operator is gradually increasing its activity.
- Most of the aircraft, during the "lock down" phase, have been stored for three months.
- All air operator's organizational areas have been affected by the crisis.
- During the critical phase of the crisis the crew planning department tried to ensure a minimum activity for each pilot.
- Most of the flights, during the restart phase, are only partially full.
- The destination aerodrome has been recently re-opened and information on the extent and quality of services, such as ground handling, is not clear.

3. Proposed list of identified hazards with hyperlinks

Instructions: activate the hyperlinks to access the proposed "threats", "consequences" and "mitigation measures" for each hazard listed below

From an ORGANISATIONAL perspective

- Staff psychological stress
- Reduction of safety resources

From FLIGHT OPERATIONS perspective

- Crew reduced situation awareness and reaction time during flight preparation
- Degradation of Handling Skills
- Pairing together pilots / cabin crew with non-recent or partially recent experience
- Inadequate cabin preparation
- Rush during pre-flight
- Lack of social distance when in the flight deck and when not utilising face masks / face coverings
- Possible conflicting information between current and old procedures
- Different levels of knowledge and proficiency of crews
- Insufficient number of pilots and cabin crew to cope with demand
- Passenger refusal to adhere to COVID-19 procedures/measures on board of the aircraft

From a TRAINING perspective

- Reduced training
- Training programme not updated, following changes and crew exemptions
- Lack of familiarity / training for category "C" airport

From an OPERATION CONTROL CENTER's and CREW SCHEDULE DEPARTMENT perspective

- Reduced staff
- Reduced training of air operator staff
- Inaccurate flight planning (route and crew package)
- New destination or new type of operation(s)
- Rushed release to service of aircraft

From the GROUND DEPARTMENT perspective

- Inaccurate loading procedure
- Change of ground handler
- Reduced service / support at destination
- Changes to local travel restrictions and communication of regulatory changes
- Insufficient GSE/vehicles to service aircraft
- Lack of communication with ground handling service provider (GHSP)
- Sanitary procedures not followed by the GHSP staff

From a CAMO and MAINTENANCE perspective

- Rushed release to service
- More time needed for the maintenance inspection(s)
- Defects are not rectified in a timely manner
- Limited availability of maintenance staff
- Damages to the aircraft
- Reduced size of the CAMO
- AMP not adapted to the utilization of the fleet
- Frequent disinfection of fleet a/c
- Unavailability of spare aircraft or spare parts
- Non-revenue flight after long storage
- Fuel contamination

AREA	ORGANISATIONAL (Staff wellbeing, Commercial & financial pressure, etc.)		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Job instability/uncertainty Financial distress	**Staff psychological stress**	Staff and crew (un)well-being Psychological pressure Errors / lapses Fatigue Diminution of alertness Increased risk-taking	Explanation: During the period of unprecedented job instability and cost-savings, staff are facing psychological pressure and stress with possible consequences on their safety performance. Productivity gains from crews will involve extending maximum working hours allowed in a duty period, reducing rest periods during duties. Overhaul of pay and benefits may be central. Mitigation: - Clear communication with the staff on airline strategy (business recovery plan): it is important that there is a robust and centrally coordinated communication strategy in place to prevent rumor and misinformation that will create more uncertainty and stress. Such communication should provide up to-date and reliable information to employees and customers. - Staff resource plan timely adapted to the short, mid and long term operation outlook - Access to mental wellbeing support programs such as pilot peer support (see EPPSI[1]) – see also Commission Regulation (EU) 2018/1042[2] - Direct Management Contact with Staff highlighting the importance of the safety and wellbeing of all colleagues as a top priority and outlining the employee supports available (e.g. Employee Assistance Programmes (EAP). - Remind the employees of the organisation's Just Culture

[1] European Pilot Peer Support Initiative at http://eppsi.eu/

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1591935555034&uri=CELEX:32018R1042

AREA	ORGANISATIONAL (Staff wellbeing, Commercial & financial pressure, etc.)		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress	**Reduction of safety resources**	Reduced effectiveness of safety and compliance staff / department Ineffective monitoring of management system key processes such as the hazard identification and risk assessment process. Backlog in audit plan / decreased performance Dismissal or furlough of key staff Loss of competence due to cost-saving measures Increased workload due to COVID-19 management of change activities (downsizing, COVID-19 contingency measures, re-start of operations).	Explanation: During the commercial and financial difficulties, air operators may be tempted to significantly cut the resources in the whole organisation. Safety and compliance may be affected by these cost-saving measures. Organisations have to rely on safety and compliance monitoring function during the critical phases of the re-start. Therefore organisations should avoid any cost-saving measures in this area. Mitigation: - Clear business plan to restart operations and manage changes considering short/medium/long term communication; transparency on the recovery plan towards all employees and towards the overseeing authorities - Identification of critical tasks and prioritization of tasks - Strengthen safety and compliance monitoring capabilities - Adapt the frequency of the SRB meeting and SAG if appropriate - Procedure to monitor the wellbeing of staff where to report any concern in an anonymous and confidential manner - Promote internal reporting culture to facilitate the identification of possible negative safety trends - Compliance is paramount

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Lack of Exposure due to stopped Operation Pilot with reduced recent experience/exposure Pilot without recent experience/exposure (basically the same as above but even exaggerated)	**Crew reduced situation awareness and reaction time during flight preparation**	Wrong fuel decision Not recognizing MEL/Maintenance issues Not realizing possible mistakes in Flight planning/calculation Missing items in e.g. briefing, Inadequate A/C preparation Ineffective walk around Wrong cockpit preparation Incomplete Flow Pattern Take off abort Incorrect A/C configuration	Explanation: Flight preparation is a key process to ensure a safe flight. Due to the lack of recency and self-confidence, the probability of not performing an accurate flight preparation is higher after prolonged crew inactivity. Checking pre-flight documents, e.g. OFP, weather, NOTAMS, Aircraft/maintenance documents etc. and fully comprehending the meaning (having a mental picture) takes significantly longer than usual, due to the lack of routine. Mitigation: - Air operator should consider reviewing the time planned for the flight preparation on ground. - Air operators may consider reviewing its pre-flight briefing package to optimize the flight preparation and prevent possible shortcomings.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Pilot with reduced recent experience/exposure Pilot without recent experience/exposure (basically the same as above but even exaggerated) Loss of skills by a pilot not flying over 90 days but not more than 120 days Loss of skills by a pilot not flying over 120 days but not more than 150 days (only for some pilots – but they still could made members of a crew)	**Degradation of Handling Skills**	Exceeding operating limits (Max flap speed, MMO, Max extended gear speed) Unstable approaches Handling errors Disrupted Flow Pattern Runway excursion Tail strike (during T/O and/or landing) Hard landing Upset Recovery skills Incorrect A/C configuration	Explanation: Most of the air operators had to reduce their flying activities during the peak of the pandemic. This may have had an impact on pilot flying skills. In the same vein, young pilots with limited experience may be more impacted that experienced pilots. Mitigation: - Consideration on pilots with limited flying experience should be given when considering training requirements before returning on duty after long inactivity - Consider SIM training specifically addressing handling skills, including e.g. T/O, and LDG in various crosswind scenarios, RWY condition, light conditions, A/C weights; - Consider to develop specific briefing for LTCs and TRIs during RNO to address specific reduced experience-related issues - Avoid any amendment to SOP during the RNO phases - Consider discussing possible RNO scenarios during classroom / WebEx / ELearning or distance learning / briefing to increase crew awareness on possible risk during the RNO - Roster, when possible, crew with recurrent training not expired – or consider pairing experienced and non (recent) experienced crew after the conducting of a risk assessment. - Consider the possibility to plan the roster of pilots without recent experience paired with a line training captain or a TRI

			- When no option available other than rostering pilots without recent experience, consider to apply operational limitations [e.g. reduction of maximum crosswind component, increased operational minima etc.]

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Inadequate crew rostering procedure Commercial pressure Lack of crew availability	Pairing together pilots / cabin crew with non-recent or partially recent experience [e.g. pairing of two pilots neither of whom have carried out any flight in the preceding 90 days]	Exceeding operating limits (Max flap speed, MMO, Max extended gear speed) Unstable approaches Handling errors Disrupted Flow Pattern Runway excursion Tail strike (during T/O and/or landing) Hard landing Upset Recovery skills Incorrect A/C configuration	Explanation: Due to financial distress, airlines may decide to reduce the number of crew. The reduced availability of pilots may have an impact on the pairing of the crew Mitigation: - Specific guidance to be developed for the scheduling department and communicated to the crews - Additional operational restrictions to be imposed in relation to crew compositions - Consider rostering experienced pilots for the first flight of an aircraft just after prolonged storage - Update roster documentation to include information about exemptions

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Cabin Crew with reduced or no recent experience/exposure	**Inadequate cabin preparation**	Missing items Inappropriate security search Ineffective safety briefing Errors in arming/disarming emergency doors Incorrect safety equipment check Medical skills	Explanation: Cabin crew impacted by reduced flight activities will be prone to possible errors during the preparation of the aircraft. Mitigation : - Air operator should consider reviewing the time planned for the preparation of the aircraft - Air operators may consider introducing a dedicated Check List to support the cabin crew tasks on ground - Air operators may develop training material and procedures about medical issues related to COVID-19 consequences - Consider classroom training to highlight specific focus areas.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Increased time to access the airport and the aircraft parking position	**Rush during pre-flight**	Wrong entries on FMS during pre-flight Errors in performance calculation Errors in W&B calculation Poor pre-flight briefing Inadequate cockpit preparation Wrong aircraft configuration (i.e. pitot cover or landing gear pins not removed, not all covers / doors safely fastened) Take off abort	Explanation: Pilots and cabin crew may face commercial pressure during the restart of the activities Mitigation: - Air operators should adapt the time allocated for pre-flight duties according to the “new” aerodrome procedures [e.g. consider possible delays during security and new procedures related to the access of the airport and aircraft etc. This includes boarding etc.] - Remind the crew of the importance of a safe operation and the organisation’s Just Culture in these challenging times.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Spread of Covid-19 Access to the cockpit or cabin by external staff	**Lack of social distance when in the flight deck/cabin and when not utilising face masks / face coverings.**	Eroding staff confidence in health and safety measures , with an impact on crew wellbeing	Explanation: Face masks / coverings have been deemed inappropriate for flight deck/cabin crew use due to concerns relating to depressurization, communications and potential O2 mask use. Social distancing remains a must. Mitigation: - Increased Flight deck/cabin cleaning & sterilizing according to air operator's approved procedures, clearly communicated to the crews - Crew self-declaration procedures prior to duty ("fit for flight"?) - Procedures and provision of virucidal hand wipes and virucidal surface wipes to clean & pre-prepare all contact surfaces or any other sanitary means - Air operator shall verify the appropriateness of procedures for Ground Handling Service Provider (GHSP) staff to access the aircraft during turnaround.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New or additional COVID-driven procedures (e.g. specific announcements, use of PPE, Sanitation requirements)	Possible conflicting information between current and old procedures (SOPs, OMA, OMD etc.)	Additional Workload Confusion Wrong prioritization of tasks Fatigue Mental overload, leading to lapses and errors in all fields Wrong duty period calculations	Explanation: During the phase of reduced flight activities, the air operator may have the need to review some procedures or processes. Moreover, during the same period, most of the staff were in lockdown; crew and staff may not be aware of changes because manuals have not been updated due to the possible temporary basis of changes Mitigation: - Verify that official manuals have been amended to include latest revisions and staff receive adequate information or training

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New procedures and documentation developed during the low activity phase Temporary procedures	Different levels of knowledge and proficiency of crews (flight and cabin crew)	Use of wrong procedures Mix up of various procedures Ineffective CRM Application of different procedures	Explanation: Due to the reduced availability of training event and lockdown effect, information provided or amended by the air operator may have not been properly understood or received by the relevant staff. Mitigation : - Avoid the introduction of any new procedures before crews are properly trained / make sure which procedures should be used

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress Aggressive cost-saving policy	**Insufficient number of pilots and cabin crew to cope with demand**	Inadequate crew pairing Fatigue Inadequate rest Greater pressure to 'pass' pilots during test or simulator sessions Delay or flight cancelation	Explanation: Many organisations have laid-off pilots and cabin crew. As demand picks up quicker than anticipated, there will be increased strain on available resources. The lead time for recruiting and training staff is far greater than the speed for traffic recovery. Organisations may be tempted to hire contracted (temporary) pilots to cope with summer peak; the level of uncertainty may be high with the potential second-wave expected during the autumn/winter. Mitigation: - Clear business plan to restart operations and manage changes considering short/medium/long term communication, accompanied by transparency towards the employees and towards the overseeing authority with respect to all elements of a recovery plan - Consider crew pairing and adequate rostering - Monitor the different stages of the pandemic and review the business plan in a dynamic manner.

AREA	FLIGHT OPERATIONS		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New or additional COVID-driven procedures (e.g. specific announcements, use of PPE, Sanitation requirements)	**Passenger refusal to adhere to COVID-19 procedures/measures on board of the Aircraft**	Increase in unruly passengers	Explanation: The COVID-19 pandemic necessitates air operators to introduce new COVID-19 driven procedures for crew and passengers. In addition, countries also have different requirements that must be met by crew and passengers. Compliance with these procedures/requirements must usually be done on board the aircraft. Fear of infection may cause more disputes between passengers due to non-compliance or poor hygiene etiquette, or passengers showing symptoms similar to those associated with COVID-19. Mitigation: - Consider good information provision to passengers prior to flight - Consider cabin speech - Provide crew with good instructions and explanation why measures are necessary

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Extensive/accumulated use of alleviations Aggressive cost-saving policy	**Reduced training**	Degradation of professional competencies Reduced decision making skills Reduced CRM Reduced situation awareness Degraded understanding of aircraft performance	Explanation: Due to the reduced availability of training event and lockdown effect, many staff may have not received adequate training and this can be aggravated by financial distress. Mitigation: - Review the training programme to ensure that essential training needs will be delivered. - Consider SIM training specifically addressing handling skills, including e.g. T/O, and LDG in various crosswind scenarios, RWY condition, light conditions, A/C weights etc. *Note: TRI, TRE and LTC recency should be maintained to allow for continuation / additional training when required.*

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Unavailability of training means Lack of simulator access	**Training programme not updated, following changes and crew exemptions**	Negative training Not confident crew Degradation of professional competencies Diminution of training efficiency Inability to perform specific training manoeuvers that are only possible in FSTDs Training not delivered Reduced effectiveness of training	Explanation: Possibility of negative transfer of training due to wrong emphasis (check vs. Training, emphasis on legal requirements instead on crew proficiency). Insufficient simulator availability to conduct necessary crew training. Particularly an issue for air operators who do not have their own simulators and are dependent on third-parties. Mitigation: - Air operator's crew training department has to consider to perform a training gap analysis to identify the most significant areas affected by the crisis - The analysis of the training needs shall include granted exemptions, lack of exposure, training refreshers, new procedures, new operations etc. - Update the training programme according to the outcome of the gap analysis to address the most critical training items not covered due to the unavailability of simulators and training facilities.

AREA	TRAINING		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Lack of familiarity / training for category "C" airport	Pilots not qualified to fly to certain destinations Approach and landing incidents	Explanation: Restricted access to simulators means that training for special airports may be limited, rushed or overlooked altogether. Mitigation: - Air operators should consider temporary alternative way to qualify the crew, being approved by the NCA and amend their procedures – such measures can only be temporary and re-assessed based on the evolution of the situation - Adapt the roster policy accordingly

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure / labor laws (e.g. short time work regulations)	**Reduced staff**	Inaccurate flight planning, including route, fuel, and alternate planning (e.g. firefighting capacity required might have changed) No update information Error Erosion of experience High workload as demand picks-up Fatigue and crew fatigue	Explanation: Cost-saving measures may affect all staff, including OCC staff and Crew schedule department. This may affect the quality of the flight planning and flight preparation. Mitigation: - Plan the flight considering contingency plan – on several levels and for different scenarios. - Develop specific GM / Check-Lists / What-to-do Lists for every scenario and train the crews on the way those should be applied. - Organise a special team of experts available for the Crews for instant remote contact – with a task to support the crews - especially if those crews are already in the air. - Plan to restart the operations on a step-by-step basis. Plan enough time for Q&A. Understand what is hampering the new developed SOPs – what is working and what is not.

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New procedure New policy New type of operation New destination	**Reduced training of air operator staff**	Inaccurate flight planning Error Inaccurate performance calculation Stress	Explanation: Cost-saving policy will have an impact on the availability of training. Mitigation: - Air operators may consider to give extra time for the flight planning and preparation of the flight briefing package. - Use double-checking if possible for the preparation of flights to new destination(s)

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Inaccurate flight planning (route and crew package)	Wrong Operational Flight Plan Increased number of diversion Increased flight time Inappropriate ATC clearance Inaccurate fuel planning Wrong NOTAM or miss newly published NOTAMs Aerodrome closed Missing airspace restriction	Explanation: Flight planning quality may be affected by an increased number of NOTAMs as well as by unavailability of navigation aids, closure of airspace etc. Mitigation: - Air operator has to review its procedures for flight planning to allow more (and sufficient) time, and adequately address any safety issues that may hinder the quality of flight planning (including impact of Covid-19 measures introduced in crew and flight planning facilities, having possible impact on time spent in the facilities) - Evaluate the availability of usual en-route alternates that may be closed due to the crisis. - Plan the flight considering contingency plan – on several levels and for different scenarios. - Develop specific GM / Check-Lists / What-to-do Lists for every scenario and train the crews on the way those should be applied. - Ensure sufficient resource to manage the volume of NOTAMS (process AU, Volume to be proactively managed) - Contact destination aerodrome / airport before the flight to ensure the accuracy of information.

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	New destination or new type of operation(s) COVID related entry / immigration restrictions	Wrong Flight Plan Inaccurate flight envelope preparation Inaccurate aircraft performance Destination/Enroute Alternate/Alternate planning not considering COVID related restriction (NOTAM)	Explanation: Air Operators may have the opportunity to open new destinations where it does not have experience Mitigation: - Air operator has to review its procedures for flight planning to allow more time and adequately address any safety issues that may hinder the quality of flight planning. - Evaluate the availability of usual en-route alternates that may be closed due to the crisis. - Plan the flight considering contingency plan – on several levels and for different scenarios. - Develop specific GM / Check-Lists / What-to-do Lists for every scenario and train the crews on the way those should be applied. - Ensure sufficient resource to manage the volume of NOTAMS (process AU, Volume to be proactively managed) - Contact destination aerodrome / airport before the flight to ensure the accuracy of information. - Evaluate aircraft performance carefully before selecting the aircraft type to use. - Consider COVID related rules/regulations/entry and immigration restriction already in flight planning phase and crew information package

AREA	OPERATION CONTROL CENTER and CREW SCHEDULE DEPARTMENT		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Lack of fleet availability	**Rushed release to service of aircraft**	Release to service of a non-airworthy aircraft Release of an aircraft with MEL non-compatible with the destination	Explanation: Due to the reduced availability of aircraft that are under storage conditions, the air operator may not have sufficient aircraft to cope with the commercial demand. Mitigation: - Air operator has to proactively establish a plan to focus on aircraft coming out of parking/storage and evaluate the timeframe required to de-store and get additional aircraft ready for operations

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
New procedures New type of operation(s)	**Inaccurate loading procedure**	Degradation in aircraft performance/out of trim condition Tail strike (TO and landing) Runway overrun	Explanation: Due to the introduction of new type of operations or new configuration of the aircraft, ground handling can be impacted. Mitigation: - Amend ground operation manual procedures - Ensure proper equipment available at destination. - Contact destination aerodrome / airport and all subcontractors there before the flight - Monitor / check the loading of the aircraft. - Deliver adequate training

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Commercial pressure Bankruptcy of usual ground handling company Large turnover of staff for GH SP (Lack of experience or qualifications)	**Change of ground handler(s)**	Inadequately trained staff Lack of qualified staff Loading errors Different ground handling procedures Possible injuries of staff Load planning / load sheet errors Degradation of ground handling standards Difficulty in verifying compliance prior to starting operations (oversight of subcontractors) Insufficient GSE/vehicles to service aircraft Lack of training	Explanation: Air operators may decide to change ground handlers following cost-saving policy or may be forced to change ground handlers due to the unavailability of the previous agent(s). New ground handling staff can be unfamiliar with the airlines standards. Mitigation: - verify that the new ground handling service provider received the aircraft documentation and the staff received the appropriate training - Preparation of Quick reference Guides and Read and do lists for Ground Crews - Evaluate ground handlers' capability to properly service the aircraft and follow the air operator's procedures.

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Uncertainty of available ground handling services at the destination Large turnover of staff for GH SP (Lack of experience or qualifications)	**Reduced service / support at destination**	Loading errors Different ground handling procedures Possible injuries of staff Load planning / load sheet errors Inadequate supervision of boarding procedures Incorrect fuel uplift	Explanation: No or not the full extent of service/support is available. In addition the turnover of staff for GH SP is well known Mitigation: - Consider possible contingency situation during flight planning. - Consider performing a remote inspection [at least desk-top review of manuals and procedures] of the GH SP (oversight of the subcontracted activities) - Air operator has to identify the significant changes affecting the GH SP.

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Changes to local travel restrictions and communication of regulatory changes	Inadequate passengers handling Inappropriate boarding procedures Last minute weight and balance change errors Unruly passengers	Explanation: Covid-19 pandemic may lead to changes and/or restrictions to airport procedures Mitigation: - Air operator needs to inform passenger in advance of possible disruption - Air operator has to consider the amendment of standard instructions to GHA - Cabin and cockpit crew should be informed about the changes, restrictions, procedures at the destination.

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Budget cut	**Insufficient GSE/vehicles to service aircraft.**	Risk of damage event Undue delays Risk of missed flight connections	Explanation: GH services may be reduced due to budget cut. Mitigation: - review the turnaround time and impact on Flight Duty Period - consider to timely inform the passengers

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Lack of communication with ground handling service provider (GHSP)	Changes to DOW/DOI not notified Loading and/or W&B documentation errors	Explanation: The changes in procedures, documentation have not been communicated to the GH SP Mitigation: Review the communication policy with the GH SP

AREA	GROUND		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Spread of Covid19	**Sanitary procedures not followed by the GHSP staff**	Aircraft contaminated with infectious disease	Explanation: GH SP may have procedures to cope with the pandemic. Mitigation: - additional cleaning requirements; consider EASA Safety Directives 2020-03[3] and 2020-04[4] - verify the adequacy of the air operator's procedures with the GHSP - consider EASA /ECDC Aviation Health Safety Protocol5; latest revision of SIB 2020-025; and the EASA guidance on "Management of crew members" and on "Aircraft cleaning and disinfection"

[3] https://ad.easa.europa.eu/ad/SD-2020-03
[4] https://ad.easa.europa.eu/ad/SD-2020-04
[5] https://www.easa.europa.eu/newsroom-and-events/news/passenger-health-safety-updated-measures-summer-2020

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Reduced staff Staff overloaded Lacking availability of qualified personnel High number of engineering recurrent training overdue HF impact on line or base Maintenance department due unforeseen workload Time pressure Psychological pressure and wellbeing High number of aircraft have been stored. Some may have been parked away from the availability of a maintenance organisation.	**Rushed release to service of aircraft**	Aircraft not compliant with the airworthiness requirements Damage or failure not detected or fixed Aircraft engaged beyond technical limits or not properly trouble-shooted Possible triggering of real or spurious warnings and indications Unclear technical status Significant number of deferred defects and open MEL items Delay / inflight turn back / diversion / aborted T/O Backlog of Aircraft Maintenance Programme (AMP) tasks Airworthiness exemptions (such as AMP tasks extension or ARC validity) Errors due to time or psychological pressure	Explanation: Aircraft Systems after mid/long term storage tend to be less reliable. Many calendar-based maintenance items may be overdue. Due to the pandemic, some maintenance organisations may have reduced the number of staff. During the lockdown, the CAMO may have stopped its activities: the airworthiness status of the fleet may be uncertain; some ADs may not have been carried out etc. Mitigation: - Sufficient time should be given to the CAMO to re-assess the airworthiness status of the aircraft, especially when re-engaging the aircraft after de-storage and prepare the maintenance package for the Aircraft Maintenance Organisation(s) (AMO). - CAMO should plan sufficient time to let the AMO carry-out the maintenance package, keeping in mind that the de-storage of the aircraft will reveal defects, which will impact the duration of the maintenance check. CAMO and AMO should anticipate the availability of spare parts. - Coordination between the OCC, the CAMO and the AMO should be ensured to better plan the availability of the aircraft for the air operations. - The airworthiness status of the aircraft should be carefully followed-up and passed to the OCC for the flight preparation so that the crew are fully aware of the aircraft status, defects and open MEL items before starting air operations - The OCC and CAMO in liaison with the AMO should double check the airworthiness status and the release to service of the aircraft with a

		Flight Crew could be unaware of the fact that aircraft is not airworthy	special attention to the defects found during the checks or incomplete tasks. - As regards to exemptions: the air operator should avoid the compounding effect of cumulative exemptions granted in other domains [airworthiness exemptions with exemptions related to the lack of crew's recent experience]. Plan carefully the crew pairing. - Ensure that the pilots will be notified that the aircraft has just been de-stored (i.e. first flight after de-storage) - After de-storage, the air operator may decide to plan a non-revenue flight before dispatching the aircraft for operations, to check its airworthiness. - Ensure adequate maintenance contract(s) and maintenance capabilities at the aerodrome where the aircraft has been stored. - Ensure that the availability and capability of maintenance organisations at the destination.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Reduced staff Lack of qualified personnel High number of engineering qualification overdue HF impact on Line or base Maintenance department due unforeseen workload Time pressure Psychological pressure and wellbeing High number of aircraft have been stored. Some on them have been parked away from the availability of a maintenance organisation	**More time needed for maintenance inspection(s)**	Aircraft not airworthy Damage or failure not detected or fixed Aircraft engaged beyond technical limits or not properly trouble-shooted Possible triggering of real or spurious warnings and indications Unclear technical status Significant number of deferred defects and open MEL items Delay Backlog of Aircraft Maintenance Programme (AMP) tasks Airworthiness exemptions (such as AMP tasks extension or ARC validity) Errors due to time or psychological pressure Flight Crew could be unaware of the fact that aircraft is not airworthy	Explanation: Because the aircraft did not fly for a long period of time, the number of maintenance tasks and inspections needed to re-store the aircraft back to operations will be higher and a longer time to complete them will be necessary. The nature of the inspections could be also altered. Unavailability of spare parts may impact the delivery of the aircraft. Mitigation: - Sufficient time should be given to the CAMO to re-assess the airworthiness status of the aircraft, especially when re-engaging the aircraft after de-storage and prepare the maintenance package for the Aircraft Maintenance Organisation(s) (AMO). - CAMO should plan sufficient time to let the AMO carry-out the maintenance package, keeping in mind that the de-storage of the aircraft will reveal defects, which will impact the duration of the maintenance check. CAMO and AMO should anticipate the availability of spare parts. - Coordination between the OCC, the CAMO and the AMO should be ensured to better plan the availability of the aircraft for the air operations. - The airworthiness status of the aircraft should be carefully followed-up and passed to the OCC for the flight preparation so that the crew are fully aware of the aircraft status, defects and open MEL items before (re)starting air operations - The OCC and CAMO in liaison with the AMO should double check the airworthiness status and the release to service of the aircraft with a

			special attention to the defects found during the checks or incomplete tasks. - Ensure adequate maintenance contract(s) and maintenance capabilities at the aerodrome where the aircraft has been stored. - Ensure that the availability and capability of maintenance organisations at the destination.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress of the air operator Poor safety culture	**Defects are not rectified in timely manner**	Operations with multiple open MEL items In-flight failures. Spurious alarms Increase of workload for the pilots Take-off abortion Delay / flight cancellation / diversion / aborted take-off	Explanation: Due to the cost-saving policy, the air operator may elect to postpone maintenance tasks as much as possible. Postponing the rectification of defects when the trouble-shooting is demanding may be exacerbated. Mitigation: - Avoid to postpone any maintenance task on aircraft with already open MEL items - Clearly define a policy to prioritise rectification of defects based on the impact on planned operations. - CAMO should re-enforce the monitoring of the maintenance defects and a policy to handle the rectification of defects and well as postponed maintenance. - Cross-checking the recorded defects in the maintenance on board computer with the tech-log entries should complement the CAMO monitoring.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Maintenance providers limit supported locations	**Limited availability of maintenance staff**	Aircraft in AOG Cancellation or delay of flights Commercial pressure to operate the aircraft with deferred items Extensive use of MEL Repair interval extension	Explanation: Air operators may face difficulties with the maintenance service provider that had to reduce the number of staff due to the consequences of the pandemic. Mitigation: - Establish a communication line with the maintenance providers to understand their capability to cope with the maintenance needs and plan aircraft use in coordination with the OCC - Prepare a contingency plan - Make sure that the crew clearly understands their remit and privileges related to the MEL items and associated maintenance actions. - Check the robustness of an internal policy on the dispatch of aircraft with open MEL. - Ensure the monitoring and analysis of repetitive defects by the CAMO in order to be proactive in the identification of possible hazards

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Prolonged parking Inappropriate application of prolonged parking procedure and de-storage	**Damages to the aircraft**	Aircraft in AOG Delays Unknown failure of emergency systems Undetected damages to a/c systems such as leaking actuators, sealing, structure-'Sticky' Valves, Dried-Out Seals, Avionic faults, corrosion of metals etc.	Explanation: During prolonged parking, aircraft may have been damaged. These damages may have not been reported to the air operator. Mitigation: - The air operator may consider the development of a robust pre-flight inspection procedure after prolonged parking. [i.e. first inspection]. - First pre-flight inspection should be carried out by qualified maintenance staff in support of the crew.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial distress	**Reduced size of the CAMO**	Possible overruns on maintenance tasks Overdue Airworthiness Directive(s) (AD) or missed AD Inappropriate management of maintenance tasks and airworthiness status of the fleet Not appropriate evaluation and follow-up of technical log book entries Lack of competence due to laid-off personnel	Explanation: Due to the cost-saving policy, the air operator may decide to reduce the size of the CAMO to the minimum. Mitigation: - The air operator shall analyse the impact of this staff reduction and develop a robust procedure to ensure the airworthiness of the aircraft. - The air operator should develop an effective mapping of CAMO staff competences in order to ensure the continuing airworthiness monitoring function. - The air operator and its CAMO should ensure an effective line of communication with the maintenance organisation for a better coordination about the maintenance actions to take

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	AMP not adapted to the utilisation of the fleet	Damage to a/c systems Corrosion Wrong utilization of some fleet aircraft Reliability programme not anymore relevant	Explanation: The frequency of the Aircraft Maintenance Programme (AMP) items are based on the number of flight hours and cycles. Due to the reduction of activities, the determination of these frequency as well the nature of the maintenance inspections might not be any more adapted to the RNO. Mitigation: - The air operator and its CAMO should reconsider the impact of the volume of flight and new types of operations on the relevance of the AMP. - The air operator and its CAMO should reconsider the relevance of the reliability programme.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
	Frequent disinfection of fleet a/c	Damages to cabin interiors, flight deck Corrosion on exposed a/c structure, Defects to cabin electronic system [IFE, PSU, FAP] Unknown long term effects of disinfection on aircraft hardware	Explanation: Repetitive use of disinfectants or any other sanitary products may damage aircraft systems and structure. The existing AMP does not explicitly address deterioration of interior hardware from the extensive use of disinfectants. Mitigation: - The air operator and its CAMO should follow the manufacturer instructions about the cleaning and disinfection of the aircraft. - The air operator and its CAMO should consider whether maintenance inspections should be added to the AMP and any other associated documents such as the pre-flight or daily C/L.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Financial pressure or distress	**Unavailability of spare aircraft or spare parts**	Delayed maintenance Postponed maintenance, Prolonged AOG Prolonged operations under MEL + RIE Spare aircraft non available delay Increased rate of swapping equipment between a/c Damages Air operator uses parts from a parked aircraft to dispatch the operating fleet. Unknown airworthiness status of the parked aircraft from which parts have been cannibalised	Explanation: The air operator may not have a spare aircraft or spare parts available in case of dispatch issue. Therefore it may be necessary to dispatch an aircraft with deferred items. Mitigation: - The airworthiness status of the aircraft should be carefully followed-up and passed to the OCC for the flight preparation so that the crew are fully aware of the aircraft status, defects and open MEL items before (re)starting air operations - The air operator shall develop a proactive policy for the management of the supply chain. - The air operator with its CAMO should consider to develop a procedure to ensure the airworthiness and the release to service of the parts taken from the parked aircraft. The status of the cannibalized aircraft should be clearly recorded.

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Prolonged parking in a location where a maintenance organisation is not available Wildlife Nesting	**Non-revenue flight after long storage**	Not airworthy aircraft Degraded aircraft systems Inadequate application of non-revenue flight procedures Clogged pitots, landing gear bay, APU exhausts, other Vents/Orifices damaged by wildlife Low or high rejected T/O Unreliable high speed event	Explanation: The aircraft may have been parked in allocation far away the availability of a maintenance organisation to restore its airworthiness. Consequently a non-revenue flight is needed with exemptions approved by the State of registry. Mitigation: - The air operator should develop a robust procedure and policy for the ferry flight and the maintenance check flight. - The air operator shall develop a clear procedure for the OCC, when planning a non-revenue flight. - The air operator shall ensure that the pilots qualified for the maintenance check flight received adequate information in coordination with the CAMO and AMOs on the maintenance tasks performed on the aircraft. - The air operator shall ensure that the pilots receive relevant information before the non-revenue flight, including flight restrictions or conditions associated to the exemptions [e.g. landing gear down, maximum flight speed or flight level].

AREA	CAM (Continuing Airworthiness Management) / MAINTENANCE		
THREAT	**HAZARD**	**CONSEQUENCES**	**DESCRIPTION and MITIGATIONS**
Prolonged parking in a location where a maintenance organisation is not available	**Fuel Contamination**	Filter clogged Engine flameout Reduced performance of the aircraft Delay or flight cancellation	Explanation: Fuel after prolonged storage may be contaminated Mitigation: - The air operator has to develop a robust procedure to ensure that, after prolonged parking, the quality of fuel is checked before the first next flight. In addition, with the possible contamination of fuel tanks at the aerodrome, the procedure can be extended to the next flights to come. - The air operator shall ensure that the CAMO and AMOs adhere to the manufacturer instructions as regards to fuel contamination [e.g. Airbus issued In-Service-Information 28.00.00166 on Fuel]. C/L, pre-flight or any other documentation should be amended to put emphasis on this safety issue.

Avoiding Adverse Drug Interactions

Impairment from medication, particularly over the counter (OTC) medication, has been cited in a number of accidents in general aviation. In a 2011 study from the FAA's CAMI Toxicology Lab, drugs/ medications were found in 570 pilots (42%) from 1,353 total fatal pilots tested. Most of the pilots with positive drug results, 90%, were flying under CFR Part 91.

What's the Problem?

We all know that some drugs may compromise a pilot's ability to control the aircraft and/or adversely affect judgment and decision making. The difficulty comes for accident investigators in trying to quantify the known detriment that comes with various medications and the underlying conditions that require their use.

Another area of concern is that airmen do not always disclose all of their medical conditions to their Aviation Medical Examiner (AME). Both the undisclosed condition and the treatment can endanger the airman and compromise public safety. Undisclosed treatments could hide potentially impairing drug interactions. That's why it's important to disclose any medications you are taking to your AME. According to a 2015 CDC study, nearly 74% of doctor office visits resulted in drug therapy and 24% of the U.S. population had 3 or more prescriptions. In addition, many medications have unexpected interactions with other medications, including over the counter medications (OTCs), supplements, and herbals. For example, antihistamines can adversely react with some prescription drugs used to treat high blood pressure. These interactions can be exacerbated in the aviation environment.

Also certain foods can increase or decrease the concentration of some drugs. An example is grapefruit or grapefruit juice which can affect how long some medicines may stay in the body and may cause dangerous side effects. Here's a resource you can use to learn more about adverse food and drug reactions: https://bit.ly/3jvOCZF. It describes some but by no means all, adverse drug and food interactions.

How Long?

So if you have to take an impairing medicine, how long should you wait before you resume flying? Every medicine is different, but a good rule of thumb is 5 times the half life of the medication, or by the dosing interval (if the half-life information is unavailable). If a medication says to take it 4 times per day, the dosing interval would be 6 hours. Therefore the wait time after the last dose would be 30 hours (6 hours x 5 = 30 hours). Other medications may have longer or shorter intervals which is why it's important to talk to your AME.

Continued on Next Page

Where Can I Get More Information?

A good place to start is the new OTC medication guide listed below. The guide provides pilots with a list of OTC medications that are used to treat a common ailment that are generally safe (GO) and those that are not (NO-GO). Take a close look at this list because some medications we regard as equivalent may have very different impacts on safety. Be sure to check out the Do Not Issue/Do Not Fly section too. You can also find good information on drugs through trusted government sites like the National Institute of Health's Medline site at https://medlineplus.gov. This site lists both generic and trade names along with side effects and warnings for almost every drug out there.

What to Look For

The Food and Drug Administration (FDA) requires standard labeling for all OTC medications. These standard medication labels include the active ingredients, directions for use, and highlight potential side effects like drowsiness in the warning section. Be sure to check out our new OTC medication guide listed on the right.

Supplements may also interact with OTC and prescription medications to cause impairment. It's also important to note that supplements may have similar labels**,** but are not regulated by the FDA, and therefore do not need to meet a specific standard. This is especially true for cannanbidiol (CBD) products. The CBD industry has widely varying quality control and labeling leading to significant discrepancies from package labels including much higher THC levels than disclosed. This can cause both impairment and possibly a positive drug test. Therefore, the FAA recommends against the use of CBD products by airmen.

Resources

- What OTC Medications Can I Take and Still Be Safe To Fly?

  www.faa.gov/go/pilotmeds

- AME Guide — Pharmaceuticals

  www.faa.gov/about/office_org/headquarters_offices/avs/aam/ame/guide/pharm/

- AME Guide — Do Not Issue — Do Not Fly

  www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/pharm/dni_dnf/