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.