

SAFOPS

List of potential hazards associated to the recovery of normal operations following COVID-19 restrictions

EUROCONTROL Safety Team developed a generic safety argument for the recovery of normal operations following COVID-19 restrictions.

Transition planning supporting safe return to normal operations includes identification of the transition hazards and management of the associated risk.

Some of the transition hazards will be specific to the particular operational environment but there will be hazards that are similar across national borders.

It is a SAFOPS task, as defined in its ToR, to support a collaborative process for identification of operational safety hazards. There is a benefit of scale for SAFOPS members to share their views on potential transition hazards examples. The resulting, collaborative example list will aggregate the collective knowledge on the subject.

The list of example hazards provided in the table overleaf is not restricted at one particular level or boundary of the ATM system. The example hazards are potential safety issues that are not necessarily independent of each other. Some of the items in the list can also be considered as disruptors that could affect higher level operational hazards/ risk.

It is important to note that the potential mitigation measures provided in the third table column are not exhaustive, i.e. the suggested measures do not address all identified potential causal and contributory factors. In addition, the pertinence and effectiveness of the suggested measures may differ depending on the local conditions and specific COVID-19 lockdown impact. Therefore, any of the suggested hazard mitigation measures should be assessed for its applicability to the local operational environment, if considered for implementation.

Backward traceability to the safety arguments supporting the mitigation of the hazards is provided in the last table column. The safety argument scope is limited to ATM/CNS; hence, the action delivering the safety arguments provide partial mitigation to some of the hazards that include contributions from the airport and flight operation domains.

Transition to normal operations following COVID-19 lock down – potential hazards

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
Hz-01	Capacity imbalances and unusual traffic patterns at regional and/or network level.	Different pace of capacity recovery by ANSPs. Insufficient coordination with NM, other ANSPs, AOs, military and airport operators.	European NOP - 2020 Recovery Plan and related coordination and planning arrangements. Re-evaluate airport capacity and notify concerned parties.	Arg.5.1.1 Arg.5.1.1 Arg.5.1.1
Hz-02	Planned ATC sector configuration inadequate to actual traffic demand.	Airports had to accept many grounded aircraft, so the capacity on ground is temporarily reduced. Inflexible planning of ATC sector configurations.	Structural meeting platform to discuss weekly (or more often, if needed) the different aspects, coordinating and planning the capacity increase; also the CFSPs should participate.	Arg.5.1
Hz-03	Pre-tactical ATFM measure(s) inadequate to actual traffic demand.	Insufficient and/or inefficient simulated scenarios/exercises for the changing traffic density and pattern. Low predictability of traffic evolution. The high volatility of predictions implies that any adjustments to system capacity are very difficult to be made reasonably in advance.	Consider holding the network flow planning meeting twice a day: one in the morning for post-ops analysis and the normal one in the afternoon for the day after. Reinforce and expand Collaborative Decision Making (CDM) cells including a wide range of stakeholders at different level: <ul style="list-style-type: none"> • Airport CDM • En-Route CDM • Overall Network CDM Co-ordinated adjoining ACC-ACC and local ATS/CNS Common Transition Plan by phases, dependant on agreed airspace and ATM capability Tactical update to the planned sector configurations and ATFM measures.	Arg.5.1

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
Hz-04	Insufficient number of operational and technical staff to meet the increasing demand in the transition period and beyond it.	<p>Disproportionate demand due to cancelation of lockdown measures/country-based/region-based and significant number of staff locally still under quarantine.</p> <p>Number of staff reduced (e.g. retired, furloughed) to alleviate financial impact.</p> <p>Some operational staff are unable to return to work physically due to lockdown/quarantine restrictions in their respective countries.</p> <p>COVID-19 infection, which cannot be prevented due to impossibility to ensure physical separation at the sector positions.</p> <p>Underlying ATCO medical condition goes unchecked/unnoticed for extended period.</p> <p>ATCO medical checks by AME postponed or delayed and medical certificate expires</p> <p>No physical separation possible during position handover/takeover at the same CWP.</p> <p>Increased risk of affecting others could provoke sick-out behaviour (observed with some medical staff in hospitals).</p> <p>Pending validation of ATCO skills (language proficiency, simulator emergency training, OJTI refresher).</p> <p>Staff training postponed or delayed.</p>	<p>ATFCM measures (capacity decrease).</p> <p>Regular health checks.</p> <p>General hygienic measures constantly promoted.</p> <p>Availability of cleaning hands points in the buildings and staff rooms.</p> <p>If feasible, set up roster for ATCOs to work in small teams; if one team member gets infected, only this team is affected.</p> <p>If feasible, plan for 4-person ATCO crew available for a 2-person sector to limit the contacts as far as possible.</p> <p>If feasible, separate the EXC and PLC positions and sector suites by transparent Plexiglas.</p> <p>If feasible, ensure physical separation in the recreation rooms. Consider cleaning and how often/when.</p> <p>Use of Contingency capacities and sector configuration.</p> <p>Set clear priorities for training ramp-up to fulfil training demand according to operational priority needs.</p> <p>Assess feasibility of remote training alternatives.</p> <p>In coordination with the CA reduce the number of hours required per endorsement over 180 days (e.g. to 30 hours until 1st September) and/or extend medical certificate validity.</p>	<p>Arg.1</p> <p>Arg.2</p> <p>Arg.5.2</p>

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>Prolonged OJT because, for a long time, the traffic will be too low and not easy to train/assess the trainee's skills.</p> <p>Training becomes extremely difficult to plan in the simulator and in the operations rooms.</p>	<p>Request CA to permit option for "Renewal assessment" in simulator.</p> <p>Temporarily reduce or eliminate facilities where staff might regularly congregate, in order to minimise danger of infection.</p> <p>If possible, increase ventilation and air filtering in ops room or other facilities where staff spends longer periods of times and air tends to be stagnant or recirculated (major factor for virus spread and infection).</p>	
Hz-05	<p>ATCO unable to maintain full situational awareness for timely conflict detection and resolution in the entire area of responsibility, in particular in traffic spike periods.</p>	<p>ATCOs unable to maintain their operational skills during COVID-19 lockdown period due to lean traffic.</p> <p>ATCOs exposed to different traffic patterns, unusual conflicts and methods of operation.</p> <p>Limited number of ATCO duty shifts and hours in position during the COVID-19 lock down period.</p> <p>Absence of procedure to verify competency/skills of senior controllers (e.g. OJTI, assessors) after prolonged period off-duty.</p> <p>Extension of temporary solutions applied during the lockdown period (e.g. SPO) in the transition period without proper risk assessment.</p> <p>Big difference in accumulated ATCO hours on duty due to rostering more often ATCOs with more endorsements (e.g. TWR supervisors) that can cover more than one position during the COVID-19 lockdown period.</p>	<p>Special training (e.g. simulator training), which can emulate the medium-high traffic levels.</p> <p>Dedicated measures for ATCOs that may have rather fragile skills – for example for very recently qualified ATCOs, ATCO approaching retirement age or staff having recently returned from illness.</p> <p>Ensure that senior ATCOs (OJTI and assessors) skills are also subject to evaluation upon their return to operational duties.</p> <p>Maintain theoretical competence by designing simulator exercises where theoretical competences are required.</p> <p>Refresh ATCO knowledge and skills that are not used during the low traffic period by alternative means, such as quizzes, presentations with recorded video / audio on different topics.</p>	<p>Arg.1.3</p> <p>Arg.1.1.2</p>

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>ATCOs providing services to aircraft with different performance dynamics / requirements, e.g. military or medical flights.</p> <p>Change in the nominal aircraft performance because of shifting airline priorities, cost of fuel etc.</p> <p>Situation may be aggravated by implementation of changes to the controller tools or of new tools and system functions that ATCOs are not yet sufficiently skilled to use due to the lack of operational experience caused by limited number of flights during the lockdown period.</p> <p>Weather formations (CBs) developing very quickly (typical for the season) will increase the complexity of the traffic.</p> <p>ATCO unable the concentrate during traffic peaks or rise of workload, or when confronted with unexpected situation.</p>	<p>Enhance non-technical skills, such as Confidence and Resilience to counteract technical skill-fade.</p> <p>Balance ATCO age and experience in shift and sector rostering schemes.</p> <p>Lower the maximum thresholds of sector monitoring values until skills' recovery. (Contemplated on The Common Transition Plan)</p> <p>Make sure flights are and remain established on conventional patterns within the AoR and at interfaces as far as practicable;</p> <p>Do not leave any implicit part in air traffic management as new behaviour and habits might have emerged and taken place during the low traffic period.</p> <p>Open more sectors than the normal operation time would require in order to maintain a minimum and continuous practice level to avoid the loss of operational skills.</p> <p>Apply ATFM measures, if necessary.</p> <p>No single person operation at ACC/APP sector or in ATC TWR.</p> <p>Extend operational evaluation and acceptance period for new equipment.</p>	
Hz-06	ATCO overload and fatigue.	Extended interval of working at sector position, less breaks.	Design flexibility into the rostering systems to afford sufficient breaks for those operating,	Arg.1.2 Arg.1.4 Arg.1.5

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>Not enough standby personnel to cover a temporary lack of staff.</p> <p>Extension of temporary solutions applied during the lockdown period (e.g. SPO) in the transition period without proper risk assessment.</p> <p>Increased operational pressures to generate minimum delays in order to avoid negative economic impact on airlines.</p> <p>Briefing time may overrun as crew reacquaint themselves with NOTAM packs resulting in departure delays, which may overload some sectors when demand is already high and ATCO skills are reduced.</p> <p>Social distancing measures impact availability and efficiency of the rest facilities.</p>	<p>whilst at the same time providing the ability to adapt ATC sector configuration to potentially unpredictable and varying levels of demand.</p> <p>Lower the maximum thresholds of sector monitoring values until skills' recovery. (Contemplated on The Common Transition Plan)</p> <p>Apply ATFM measures, as necessary.</p> <p>Consider setting up outdoor resting facilities, where fresh air and open spaces have a much-reduced infection spreading potential, if weather permits.</p>	
Hz-07	Significant increase in ATC workload to handle flights suffering technical or medical issues, VFR and training flights.	<p>Inadequate aircraft return to service - after a period of long stay on the ground and with only a brief aircraft technical check an increase of technical issues in flight may be seen. This may lead to unexpected by ATC pilot requests and unusual situations.</p> <p>Lack of experience or knowledge of aircraft maintenance personnel or lack of aircraft maintenance personnel, or inadequate maintenance intervention (e.g. procedure not followed correctly).</p> <p>Increased number of VFR flights (e.g. GA pilots willing to accumulate their necessary flight hours).</p> <p>Increased number of training flights for commercial pilots.</p>	<p>Coordinate restrictions for VFR and training flights (e.g. time zones, airspaces/sectors with less demand).</p> <p>ATFM measures.</p> <p>Use of AOs company frequencies / datalink channels to report medical urgency /health problems to the ground.</p>	Arg.5.6.5

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>Medical urgency /health problems reporting by flight crews via ATC may become more frequent and may become more COVID specific in the content.</p> <p>Increased number of aircraft diversions due to medical reasons.</p>		
HZ-08	Inadequate inter-sector and inter-unit operational coordination.	<p>Different ATCO skill levels across sector groups and ATSUs.</p> <p>Diminished ATCO skills to work/coordinate in multi-sector environment with several division levels of superimposed sectors.</p> <p>Weather formations (CBs) developing very quickly (typical for the season) will increase the complexity of inter-sector and inter-unit coordination.</p> <p>Limited civil-military coordination due to limited military flights during the confinement period.</p>	<p>Simulation sessions with busy traffic and multi-layer/-sector coordination.</p> <p>Gradual opening up of elementary sectors and sector suites in accordance with the Common Transition Plan (TP).</p>	Arg.1.3
HZ-09	Impeded ATC sector team (EXC-PLC) collaboration.	Implementation of social distancing rules and potential re-escalation.	<p>Trialling and safety assessment of the measures to identify potential issues and appropriate mitigations.</p> <p>Provide targeted TRM sessions.</p> <p>Separate ops room sector positions (EXC and PLC) and TWR positions (TWR, Ground, Delivery) by transparent screens, if feasible.</p>	Arg.3.1
HZ-10	ATCO/OPS supervisors' confusion about applicable airspace organisation and/or rules	Changes implemented during the lock down are not settled in the ATCOs' minds, because they had no opportunity to get used to them.	Find ways to communicate with ATCO while they are at home - the briefing overload can be overwhelming.	Arg.4

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
	and procedures during the transition period.	Incomplete briefing on ATCO return to work after extended period of absence (operational and personal). Rules regarding drones updated in some countries to face the emergency situation. Most probably there will be 2-3 AIRACs implemented and 'normal' software baselines while the COVID-19 measures last.	If time and effort permits, create online briefing modules. Mandatory pre-shift briefing to absorb any recent and on-going changes. Postpone implementation of planned significant changes to airspace organisation and/or procedures (e.g. new PBN procedures).	
HZ-11	Supervisors (ATCO, ATSEP and Flight data) with reduced competence in handling less-than-standard situations due to the long lean traffic periods.	Interference during bad weather, CB avoidance. Training postponement.	ATFM measures (capacity decrease).	Arg.1.3 Arg.2
HZ-12	Inadequate ATCO on-the-job training.	Ineffective OJT because, for a long time, the traffic will be too low and not easy to train/assess the trainee's skills. OJTI competence/skills reduced due to long period of training interruption. Reduced capacity to provide OJT due to low number of valid OJTI endorsements. Inefficient training process due to COVID-19 social distancing measures. Postponed ATCO training due to lack of resources.	Agree with CA extension of OJTI endorsements. Plan for the trainee ATCOs, whose qualification has been postponed or training suspended.	Arg.1.1
HZ-13	Increased stress for operational and technical staff.	Cash flow problem impact on salaries and social security – dissatisfaction, uncertainty, pessimism, etc.	Provide psychological help. Promote wellbeing type of materials and information.	Arg.5.5 Arg.5.6.6 Arg.5.6.7

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>Fear and/or anxiety about the uncertainty of the future ... for the profession, way of life, and for the world to come after de-confinement.</p> <p>Potential changes to social agreements in place.</p> <p>Fear of infection following reports of new positive cases of COVID-19 in local community.</p> <p>Confinement, bringing mental overload because of the necessity to work, educate children, and ensure the management of the household.</p> <p>Mental affection caused by isolation and concern for the family members that one cannot visit.</p> <p>Dramatic individual perception and anxiety about COVID risk</p> <p>Loss of colleague, relative or friend.</p> <p>Fear of a second wave of the pandemic.</p> <p>Changes in rapid succession without having time to adjust before the next one.</p> <p>Weary of seeing the expected and hoped-for changes behind schedule.</p> <p>Severe depression (feeling of uselessness)).</p> <p>Over-enthusiasm (being exhilarated by the return to work and not taking sufficient margins).</p> <p>Subconscious concerns that erode mental capacity and when accumulated unanswered could lead to increased absenteeism.</p> <p>Enforced sanitary measures not considered sufficient.</p>	<p>Stress management programme.</p> <p>Peer-to-peer platforms.</p> <p>Mentoring</p> <p>Promote awareness of S & F precursors and notification of S & F related conditions or safety events as soon as possible.</p> <p>Position handovers made on different CWPs at least one metre apart.</p> <p>Regular decontamination of the operations room, including of the CWPs before next operational use.</p>	

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>Imbalance in the safety/efficiency ratio putting priority on efficiency due to political and economic considerations.</p> <p>Delayed or partial maintenance of equipment due to lack of technical staff, spare parts or financial constraints.</p>		
Hz-14	<p>Lower quality or delay of safety deliverables (investigation reports, safety assessments, safety analysis, safety reports, etc.).</p>	<p>Significant reduction in safety investigators' activity and decrease in their investigation skills.</p> <p>Insufficient number of specialist staff.</p> <p>Flaws in safety deliverables due to the remote working method (e.g. FHA by teleconference).</p> <p>With fewer operations, occurrences captured in databases may cause some aggregate occurrence rates to spike upwards.</p>	<p>Implement group investigations for all significant occurrences irrespective of the investigators' allocation to ATSUs.</p> <p>Agree with the regulator on possible relaxation of notification/document submission deadlines.</p> <p>Independent review of the safety deliverables by increased number of specialists from all the relevant domains: ATS, OPS, CNS, IT systems, HF, etc.</p> <p>Postpone implementation of planned changes to the functional system.</p> <p>Prioritise change implementation according to the risk to operations, if non-implemented.</p> <p>Beware of possible false conclusions resulting from safety statistics based on lower traffic.</p>	Arg.5.6
Hz-15	<p>Increased equipment failure rates and compromised equipment maintenance.</p>	<p>Lack of preventive maintenance during the lockdown period. Postponement of corrective maintenance for some equipment (e.g. due to financial constraints).</p> <p>Spare parts for equipment maintenance not available (due to delivery issue or financial constraints).</p>	<p>Verify the requirements for cleaning materials for sensitive equipment and other surfaces.</p> <p>Coordination of system maintenance activities (back to lower traffic demand periods - night-time).</p>	Arg.3

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>Current maintenance contract may expire and may not be extended or new contracts put in place due to suspension of all public procurements.</p> <p>No possibility for on the site technical assistance and equipment health check by a third party.</p> <p>Potential damage to operational equipment when carrying out cleaning protocols to restrict virus transmission.</p> <p>Planned system changes/improvements not implemented.</p> <p>Changes implemented during lockdown, to take advantage of reduced traffic, reveal undetected bugs when load increases leading to equipment failure or suboptimal configurations.</p> <p>Insufficient number of technical and support staff.</p> <p>Diminished ATSEP system knowledge and maintenance skills.</p> <p>Return to “normal” loads of some sensitive equipment can lead to defect, due to long time of operation in underload conditions.</p> <p>Increase in the number of interventions on the network by suppliers (as we already observe before/after holidays) after cancellation of the lockdown could cause network failures.</p> <p>Compromised operational tests of new equipment/system features during the lockdown period due to the lean traffic. A significant rise in the</p>	<p>Deploy safe and efficient cleaning methods and ensure cleaning material availability.</p> <p>Properly instruct cleaning staff (in-house/external).</p> <p>Postpone planned changes to the equipment and implementation of new equipment, where feasible.</p> <p>Ensure proper availability of technical experts with the needed competence.</p>	

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		traffic level could help reveal issues not identified before.		
Hz-16	Insufficient operational equipment resources (e.g. CWPs) at the ATS unit.	<p>When room size and layout cannot support application of the new rules for physical separation/social distancing of staff, opening of needed ATC sectors could be prevented.</p> <p>Potential conflict between new cleaning policies and the need to access to the operational resources. (Flight strips could be considered as a transmission vector.)</p> <p>Cleaning materials run out or cleaning cannot 'keep up' with operational use, such that the resources have to be temporarily 'quarantined'.</p> <p>Need to maintain the ATC back-up facility in operational readiness.</p>	<p>Move operations to the back-up ATC facility during main ATC facility disinfection works.</p> <p>Simulator room/training centre configured as a contingency operations room.</p> <p>Accurate study in new CWP ergonomics/requirements.</p> <p>Deploy safe and efficient cleaning methods for cleaning of working positions and tools.</p> <p>ATFM measures.</p> <p>Update company Contingency plan with regard to pandemic conditions to ensure sufficient operational equipment and human resources.</p>	Arg.3.1
Hz-17	Unexpected behaviour of ATC decision-support tools and of other software functions.	<p>Unusual routes, flight profiles or trajectories may not be treated appropriately by the existing rules for usual traffic flows established in FDPS or decision support tools.</p> <p>Under-tested changes to the ATS system/tools software implemented during the lockdown period.</p>	<p>Prior simulation/replay of unusual trajectories expected/experienced could help identify unexpected tool behaviour and provide proper guidance to ATCOs on how to cope.</p> <p>Optimise system/tool parameters, if practicable.</p>	-
Hz-18	Lack of or reduced contracted services and maintenance/supplier support.	<p>E.g. MET services, facility maintenance services, network services, communication services, system support arrangements.</p> <p>The contractor may not return to the same operational levels as needed, e.g. not providing 24/7</p>	Consider delay on project deliveries in case of a supply contract.	Arg.3

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		hour service or providing partial or lower quality service. In the extreme case, service provision may be interrupted.		
Hz-19	Operational performance/parameters of navigation aids (e.g. ILS) and MET equipment not to the required standard (undetected).	<p>Postponement of flight inspection checks may lead to unserviceability of navigation aids.</p> <p>Improper maintenance of air navigation aids (e.g. due to reduced numbers or 'rusty' skills of aerodrome personnel.</p> <p>Calibration of MET sensors and other instruments for measuring and analysing not possible.</p>	<p>Prioritisation of flight inspection checks to selected primary navigation aids (ILS, VOR, DME).</p> <p>Establish a health safety protocol to protect concerned ground and on-board staff.</p> <p>Extension of the inspection interval based on engineering evaluation of navigation aid/equipment performance records.</p> <p>Reinforce ground testing and maintenance; use of/ask for pilot reports on current performance.</p> <p>Downgrading of the ILS facility from Category III to Category II or Category I.</p> <p>Temporary removal from service of the navigation aid/equipment (last resort).</p>	Arg.3.1.4
Hz-20	Delayed certification of particular services or equipment and delayed implementation of changes that need prior CA approval.	Increased workload of the Competent Authorities that due to the COVID-19 had to limit their operations and postpone some work.	Timely communication to CA's about planned changes, including equipment and new services.	Arg.3.4 Arg.5.6.4
Hz-21	Increased wildlife presence on/near some runways or taxiways that are seldom used or not used at all during the COVID-19 lock down period.	<p>Wildlife prevention programme not followed in full during the confinement period.</p> <p>Bird Control Unit plan and effort might not be adequate for present wildlife risk.</p>	<p>Detailed visual inspection of the manoeuvring area before resuming operations.</p> <p>Regular monitoring of wildlife activities.</p> <p>Notification to ATC and flight crews of possible increased presence of birds (e.g. via NOTAM, in ATIS).</p>	Arg.5.5 Arg.5.6.2 Arg.5.6.6 Arg.5.6.7

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
			The status of the aerodrome fences should be checked. Fences should be repaired, if necessary.	
Hz-22	Increased number of runway incursions.	<p>Lack of training or ‘rusty’ skills of aerodrome personnel (incl. aerodrome vehicle drivers) returning to work after unemployment.</p> <p>Pressure on ATCOs and traffic participants on the manoeuvring area due to the reduced runway throughput by closed taxiways (used for aircraft parking) and increased aircraft turn-around time.</p> <p>Parked aircraft infringing the ILS critical/sensitive area and/or the line of sight of air traffic control.</p> <p>Flight crew’s lack of familiarity with an airport caused by conduct of non-routine operations or destination being served by different fleet types.</p>	<p>Refresher training for aerodrome personnel working airside on the prevention of runway incursions.</p> <p>Inspection of ILS critical/sensitive areas before use of the respective runway.</p> <p>Inspection of the serviceability status of the visual aids for navigation (lights, markings and signs).</p>	<p>Arg.5.5</p> <p>Arg.5.6.2</p> <p>Arg.5.6.6</p> <p>Arg.5.6.7</p>
Hz-23	Confusion due to unusual ground movements and taxi routes on the airport movement area.	<p>Large number of parked aircraft on apron or even on taxiways, runways or other surfaces.</p> <p>Signage and markings visibility may be obstructed (by vegetation and/or parked aircraft).</p> <p>Reduced availability of airports services, in particular ‘follow-me’ service.</p> <p>Unexpected by pilots and vehicle drivers movement restrictions.</p> <p>Insufficient exchange of safety-related information between ATCs and aerodromes operators.</p>	<p>Information on closed parts of the manoeuvring area and or any movement restrictions is made available through a NOTAM.</p> <p>Convene regular Local Runway Safety Team meetings.</p>	<p>Arg.5.1.5</p>
Hz-24	Reduced terrain and obstacle clearance limits.	ATCO less proficient in providing the required terrain clearance when instructing a flight on a radar heading	Refresher briefing for ATCOs.	Arg1.3

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>or on a direct route due to low demand during the COVID-lock down period.</p> <p>Obstacle clearance limits at the airport obstructed by parked aircraft.</p>	<p>Inspection and assessment by specialists (procedure designers) of the compliance with obstacle clearance requirements before commencement of the runway operations.</p> <p>Obstacle protection surfaces of visual approach slope indicator systems (VASIS/PAPI) should be checked for possible infringements, particularly by parked aircraft.</p>	
HZ-25	Improper handling of emergencies by all involved parties.	<p>Lack of full scale or partial emergency response plan exercises.</p> <p>Obstructed (e.g. by parked aircraft) emergency access roads of rescue and firefighting vehicles to the active runway(s).</p> <p>Reduced availability of firefighting brigades at airports due to reduction of airport personnel or material supply caused by the financial impact of COVID-19 lockdown (could result in airport de-categorisation).</p>	<p>Coordinate plan for emergency response plan exercises.</p> <p>The status of rescue and firefighting equipment and vehicles should be checked. Staffing levels should be appropriate to the rescue and firefighting level of protection available.</p>	Arg.1.3
HZ-26	Inadequate alerting service.	<p>Reduced capability and skills during the crisis period.</p> <p>The use on rare occasions of the service may influence that it drops out of focus and priority during return to normal operations.</p>	<p>Review the capabilities, processes, procedures and skills to provide alerting service.</p>	Arg.1.3
HZ-27	Confusing aeronautical information regarding availability of network and airport resources.	<p>Continuous changes related to COVID19 - state borders opening/closing, airports opening/closing, changing RFFS category, etc.</p>		<p>Arg.4.4</p> <p>Arg.5.3</p>

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Hz-28	Inadequate aeronautical information regarding usual airspace design evolution	<p>Aeronautical information management might have suffered from a lack of staff to accomplish AIS data publication in a timely manner to fit aeronautical information update needs and to reflect actual updates within publications.</p> <p>It might induce discrepancies within FMS database as well as within ATM systems, including those of the NM.</p>	<p>Cross check data from different sources (AIP, commercial data providers, EAD)</p> <p>Increase coordination and collaboration between ATS Unit for AIRAC Cycle Test sessions.</p>	<p>Arg.1</p> <p>Arg.4.4</p>
Hz-29	Flight plan inconsistent with applicable airspace, route or airport availability and conditions.	<p>Multiple AIRAC changes since COVID-19 restrictions to flying began result in loss of restriction (e.g. RAD restriction) awareness by AOs and IFPS operators.</p> <p>AO/CFSP flight planning tools not updated to the latest AIP amendments and COVID-19 related NOTAMS about airspace, route and airport availability.</p> <p>Lack of experience/knowledge of flight dispatchers (e.g. new role, from other AO location, non-standard operations, recency issue).</p> <p>Reduced AOs familiarisation of restrictions associated with operations into and out of airports classified as class B or C airfields.</p> <p>NM automated Help Desk limitations to process timely the increased number of requests for help from AO Dispatchers in the changing environment.</p>	<p>Close co-ordination between FMS data providers, AOs, ANSPs and NM during the transition period and risk assessments of AIRAC changes.</p> <p>Postpone implementation of planned significant changes to airspace organisation and/or procedures (e.g. new PBN procedures).</p>	<p>Arg.4.4</p>

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
Hz-30	Increased number of airspace infringements by GA pilots.	<p>Piloting and navigation skills diminished due to the GA flight ban during the crisis in some states.</p> <p>Situation could be aggravated by a quick return of GA activity during summer period.</p> <p>GA pilots will have to “unlearn” behaviour that was accepted during the lockdown period - GA flights have been allowed into airspace where normally they would not due to too much IFR traffic.</p>	<p>Set guidelines for accommodation of GA operations within controlled airspaces to manage safely the heterogeneity of operations.</p> <p>Establish local thresholds up to which VFR traffic is allowed for practice within normally busy airspaces taking into account that VFR traffic could help maintain ATCO skills during the period of low IFR traffic demand.</p> <p>Strong communication with and information to all the GA organisations before implementing any restrictions to GA flights.</p> <p>Ensure CA support for preventive campaign.</p>	Arg.4.4
Hz-31	Incorrect aircraft navigation.	<p>Aircraft FMS DB / electronic flight bag not updated according to the last AIP amendment (missing, incorrect NAV points, missing RNAV arrivals and departures, etc.).</p> <p>Multiple AIRAC changes since COVID-19 restrictions to flying began result in loss of restriction awareness by FOOs and pilots.</p> <p>Similarly to ATC, diminished pilot skills after a period of no flying, or due to recruitment of new pilots from overseas with lower familiarity of airspace, etc.</p> <p>Flight handling errors due to: increased level of pilot fatigue caused by increased number of training flights for flight instructors and increased number of simulator hours that are not accounted of in FRMS; accelerated training given to new co-pilots; CRM</p>	<p>Close co-ordination between FMS data providers, AOs and ANSPs during the transition period and risk assessments of AIRAC changes.</p> <p>Only limited use of RNAV approach procedures during the initial phase of the transition period.</p> <p>Postpone implementation of planned significant changes to airspace organisation and/or procedures (e.g. new PBN procedures).</p> <p>The aircraft operators should re-examine their crew pairing and scheduling policies.</p>	Arg.4.4

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>issues in flight crews made up of a very experienced instructor and an under-trained co-pilot.</p> <p>Pilot inexperienced on the type of aircraft flown or lack of recent experience.</p>		
Hz-32	Partial loss or misunderstanding of air-ground communication.	<p>Diminished English language skills and phraseology discipline.</p> <p>Use of face masks on the flight deck and at ATC sector positions.</p> <p>Reduced pilot familiarity with radio frequency Change-over-Points (CoP) in the operational environment due to low hours of flying.</p> <p>Due to low hours of flying pilot familiarity with CPDLC Log on procedures may be reduced. In addition, handling of Logon failures and disconnections not as efficient.</p> <p>Reduced capability/serviceability of ground and satellite based CPDLC service providers due to COVID-19 restrictions on operational and maintenance personnel.</p>	<p>Online English language courses for non-native speakers.</p> <p>Assess face masks' impact on the R/T exchange readability and quality.</p> <p>Apply good practices for R/T exchange:</p> <ul style="list-style-type: none"> • Reduce speed of RT and clear message delivery; • Readback/hearback • Maximum 3 elements in a clearance or instruction. <p>Careful monitoring of pilot compliance with instructions and clearances.</p> <p>Question if in doubt.</p>	Arg.3.1.4
Hz-33	Ineffective aircraft safety nets.	Aircraft Safety System Serviceability such as TCAS/ACAS low due to prolonged ground layover periods.		-
Hz-34	Unexpected by ATC flight performance and/or deviation from the planned/cleared trajectory.	Changed aircraft manoeuvring characteristics (e.g. higher climb/descent rates and speed) due to lighter aircraft gross weight.		Arg.5.6.7

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
		<p>Increased likelihood of high-energy approaches due to less constrained descent phase, including very late aircraft descent (caused by fuel burn considerations).</p> <p>Fewer speed restrictions applied to flights on approach and reduced piloting skills could contribute to increased likelihood of localizer overshoot or high-energy approach.</p> <p>New SOPs in response to business model changes.</p> <p>COVID-19 related flight crew stress/distraction inducing factors.</p>		
HZ-35	Call-sign confusion	<p>Increased use of 3-4 digit commercial identifiers in ATC flight plan call-signs. (In normal operations (pre-COVID period) the majority would be converted into alpha-numeric call-signs to mitigate the possibility of call-sign confusion.)</p>	<p>Use of alpha-numeric call-signs in flight plans.</p> <p>Use of NM call-sign de-confliction tool (CSST) or of a local one by AOs.</p>	Arg.5.6.7
HZ-36	Increased vulnerability to cyber-security threats.	<p>Some IT systems not protected by the latest security controls due to having been put in hold, standby or even disconnected or due to lack of certified staff and/or limited access to the systems for preventive maintenance.</p> <p>Postponement of some cyber-related investments due to the decrease in revenues.</p>	<p>Review and update, if necessary, current security policies and guidelines for remote work and remote access to ANSP systems.</p> <p>Perform an assessment of access permissions, security updates and patches, across all systems.</p> <p>Perform vulnerability scanning, security risk assessment and update security controls of IT systems (e.g., security patches, new digital certificates).</p>	Arg.3.5

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
			<p>Consider checking systems and services (e.g. ILS, communication stations, surveillance equipment) that are not in normal operation.</p> <p>Develop/update plan for training of staff on cyber-security issues.</p> <p>Develop cyber-security related investment scenarios to support decision-making by senior management.</p>	
Hz-37	Flight crew knowledge/skill fade and decreased capacity.	<p>Recency issues due to long period of no flying or very limited number of flights.</p> <p>External stressors and distractions</p> <p>Significant changes to SOP and non-standard operations.</p> <p>New pilots (e.g. from other AO bases).</p> <p>Lack of opportunity to go through a simulator programme for additional refresher training.</p> <p>Airport infrastructure is significantly different from 2019.</p>	<p>Mitigations to be applied by Air traffic controllers</p> <p>General</p> <p>Careful monitoring of pilot compliance with instructions and clearances and questioning if in doubt.</p> <p>Request/instruct speed increases as last resort.</p> <p>Comply as far as possible with the filed flight plan route.</p> <p>Departure phase</p> <p>Inclusion of any capability for intersection departure in DCLs, where DCL service is provided.</p> <p>Inclusion of cardinal headings in pushback clearances.</p> <p>Expect lower taxi speeds.</p> <p>Monitor more carefully for taxi routing errors – be prepared for more “guidance” requests</p>	

	Hazard description	COVID-19 lock down related causal and contributory factors	Mitigation ideas (if any)	Related Safety Argument
			<p>Descent phase</p> <p>Refrain from high-speed descent clearances.</p> <p>Refrain from offering short cuts. Ensure aircraft can achieve a sensible descent profile when offering short cuts.</p> <p>Any changes to runway / approach type / arrival should be communicated to flight crew at the earliest opportunity.</p> <p>Approach & landing phase</p> <p>Limit as far as possible application of speed control.</p> <p>Use as far as possible published arrival and approach procedures instead of vectors.</p> <p>Go arounds should be as published, if not they should be clearly communicated well before the instruction to go around (where possible).</p> <p>Expect longer runway occupancy times and slower turn off speeds.</p> <p>No requests to flight crew to listen to the ATIS when on final approach.</p> <p>Instruct change to ground frequency after aircraft has vacated the runway.</p> <p>Expect later check in on ground frequency due to pilot after landing scan.</p>	

