



Regional Aviation Safety Assessment Project

*Western and Central African and
Eastern and Southern African Regions*

AUGUST 2022

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Introduction

In 2021, Flight Safety Foundation (FSF) launched a Global Safety Assessment Project to help the Foundation and its members to understand current global and regional safety needs by identifying synergies and gaps in addressing existing safety risks and emerging safety issues arising from the COVID-19 pandemic. The assessment focused on scheduled commercial air transport, business aviation and special operations.

In collaboration with regulators, regional groups and industry associations, the assessment focused on six International Civil Aviation Organization (ICAO) regions: South American (SAM), North American, Central American and Caribbean (NACC), Asia and Pacific (APAC), Middle East (MID), Eastern and Southern Africa (ESAF) and Western and Central African (WACAF). Traditional safety information was collected in the early months, such as accident, serious incident and occurrence data, and information on the number of exemptions, extensions and alleviations from State regulations issued. A deep analysis was performed on the ability of regulators to issue exemptions and of service providers to perform thorough risk assessments to make informed decisions. The information collected helped to determine the impact the pandemic has had on governments supporting their industry as well as on the industry keeping pace with its international obligations and national requirements.

Throughout the pandemic, service providers and regulators faced human factors issues that needed attention, either during crew training or on-board operations. Generally, all staff from all departments were at risk of being affected. Some of these issues may adversely affect individual and group performance as well as introducing additional safety risks.

1. Factoring the Global Pandemic Into the Methodology

The COVID-19 pandemic's impact on the global aviation community has been unprecedented and resulted in an extreme reduction in aviation activity, and in some cases, a complete shutdown of operations commencing in the first quarter of 2020 and continuing through most of 2021. The shutdown and subsequent return to service have led to many changes in the operating environment. This means that organizations need to address the management of change effectively and regulators need to engage with the organizations they oversee to ensure that the results are safe and effective. The assessment performed was timely and factored in the impact of the pandemic.

2. Safety Information Gathering

To collect the needed information from the ICAO ESAF and WACAF regions, a comprehensive survey was prepared in collaboration with the African Airlines Association (AFRAA) and sent to its members. The survey was intended to collect information on the level of risk assessments

performed and the mitigation strategies that may have been put in place during the pandemic. The survey also collected information on the level of coordination between the regulator and service provider. A total of 33 airlines in the ESAF and WACAF regions participated in the survey.

Flight Safety Foundation and AFRAA conducted a virtual workshop on Feb. 24, 2022, to perform a deeper analysis of the survey results and exchange best practices and lessons learned among participants. Over 75 participants from airlines, the ICAO ESAF and WACAF Regional Offices and civil aviation authorities (CAAs) participated in the workshop.

2.1 Survey Content

The survey, containing more than 60 questions, was prepared in consultation with AFRAA and the Foundation's Basic Aviation Risk Standard (BARS) Program and addressed the following areas:

- Business continuity plans (BCP) and emergency response plans (ERP);
- Safety management systems (SMS) and risk assessment processes;
- Ability to monitor and detect hazards and perform a risk analysis;
- Change management process;
- Civil aviation authority and industry cooperation; and,
- Human factors and crew resource management.

Section 4 of this report provides the results of the survey in comparison with the global results. Factoring in the workshop discussions this section also reflects the key outcomes and takeaways in each of the six areas reflected above.

3. Summary of Results

Air operators, regulators, ICAO and other international organizations as well as AFRAA should carefully review the survey and workshop results as reflected in Section 4 and build best practices and appropriate guidance material to further develop operators' SMSs and place a greater emphasis on the promotion, education and awareness around the mental health of aviation personnel.

Throughout Section 4, the following symbols are used to reflect the results in comparison to the other regions surveyed



The results were generally better than those of the other regions surveyed.



The results were about equal to those of the other regions surveyed.



The results were generally poorer than those of the other regions surveyed.

4. Comprehensive Survey and Workshop Results — Western and Central African (WACAF) and Eastern and Southern African (ESAF) Regions

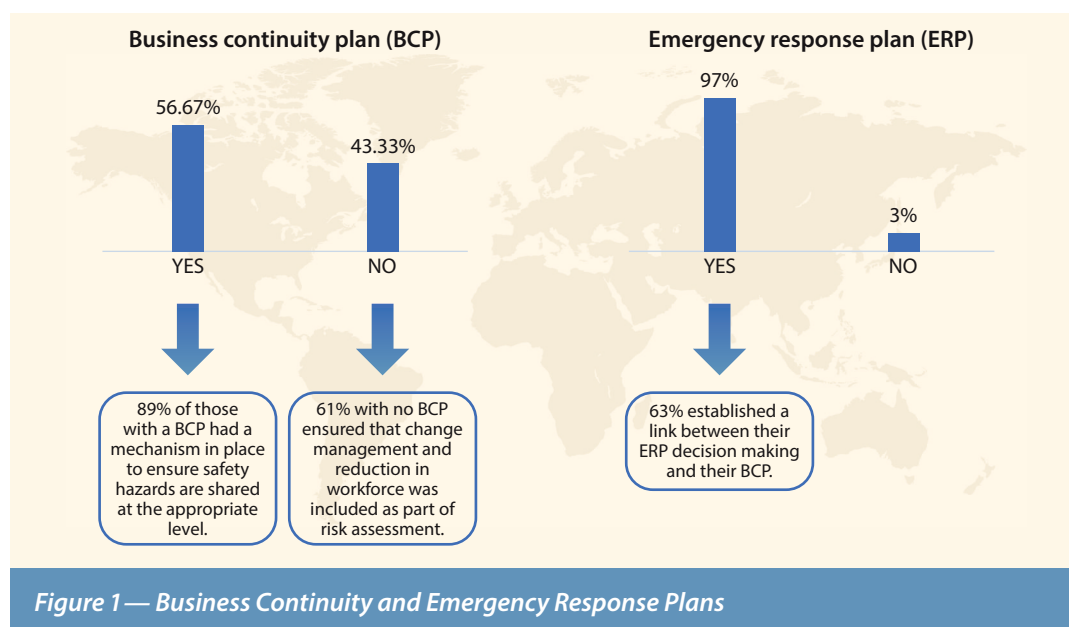
4.1 Business Continuity/Emergency Response Plans

An emergency response plan (ERP) is a comprehensive, operational-level document outlining specific roles, a set of actions and time frames to respond to unexpected situations, disruptions or potential disruptions.

In addition to emergency response and contingency plans, operators are encouraged to develop business continuity plans (BCP) which go beyond the immediate mitigation plans for unplanned incidents. There is no ICAO requirement or regulatory requirement for this. The objective of BCPs is to build and improve organizational resilience and the capability to recover quickly and effectively from any local, regional or global disruption.

Throughout the two years of the pandemic, all organizations had to put in place a BCP to survive.

So while safety experts are involved in decision-making with respect to an ERP, high-level decision-making within an organization for business continuity issues (such as reducing staff) may not always involve safety leaders in such decisions or in the assessment of the risks arising from such decisions.



Ninety-seven percent of the operators that responded to the survey indicated that they had in place an ERP. This comes as no surprise and was expected considering the ICAO requirement and all the guidance and best practices that have been developed.

Fifty-six percent of the operators responded that they also had a BCP, which is not an aviation regulatory requirement. However, large organizations typically would put this in place in case of any form of disaster.

Sixty-one percent of the operators indicated that change management and reduction in workforce were included as part of the risk assessment.



An interesting point is that about 37 percent of the operators that had an ERP as well as a BCP did not have an established link between their ERP decision-making and the BCP. In other words, some decisions may have been made at the top level on reduction of workforce without necessarily involving the needed safety leadership to provide input on the impact (safety risks) of these decisions.

Key Outcomes

- Airlines recognize the importance of tying together business continuity and emergency response planning and the need for this to be more formalized.
- Airlines were forced to make sure a proper BCP and framework were functioning throughout their organization. The larger the airline, the more complex it is to ensure the proper functioning of business continuity throughout all departments. Primary focus was placed on how to determine the minimum workforce that would be required during the pandemic. Also examined were the logistics of how different functions of the organization would work with the minimum workforce size and whether they would be sustainable. This confirmed that emergency response work alone must have a BCP in place.
- The pandemic required airlines that had both an ERP and BCP to decide where to address the disruption caused by the pandemic, and in most cases, the disruption was placed under the BCP because it impacted the entire business.
- Some airlines had the advantage of having established a BCP prior to the pandemic and were able to activate it during the pandemic. The relationships between risk managers and safety managers, including their working methods, were strengthened.
- Many airlines have disruption management and ERPs that are based on aircraft accident and incident outcomes. Processes, checklists and work instructions had to be quickly revised to support pandemic and endemic containment intervention actions.
- Restart operations required operators to consider organizational centralized restructuring; consolidated project identification of tasks, functions, timelines, skills and cost in resuming operations; air operator certification; continuing airworthiness matters; commercial plan (new schedules and marketing plan); training (critical skills gap); an effort not to lose training capability (factoring a staff reduction by 75 percent); and return to work policy (which departments needed to apply to employees on site and those working remotely).
- At the BCP level, airlines had to address drastic workforce reductions and how to determine the minimization of the workforce, coupled with the logistics of how different functions of the organization would work with the minimal workforce and how sustainable this would be.
- Generally, a high percentage of the airlines did not link their ERP decision-making and the BCP.

Key Takeaways

- It is critical for aviation executives to demonstrate safety leadership and their commitment to a positive safety culture within the organization in order to maintain the fragile balance between safety, operational priorities and financial pressures to enable sustainable operations.
- Strong safety leadership in an organization is a prerequisite for a positive safety culture, leading not only to a safer operation, but also to a more efficient and resilient business.
- Any plan in place is only effective if an activation plan is also in place. Once activated, clarity is required to identify who gets involved, as well as the pivotal roles which would go

beyond safety and security personnel and constitute a network of entities and personnel that report to the emergency and crises centers.

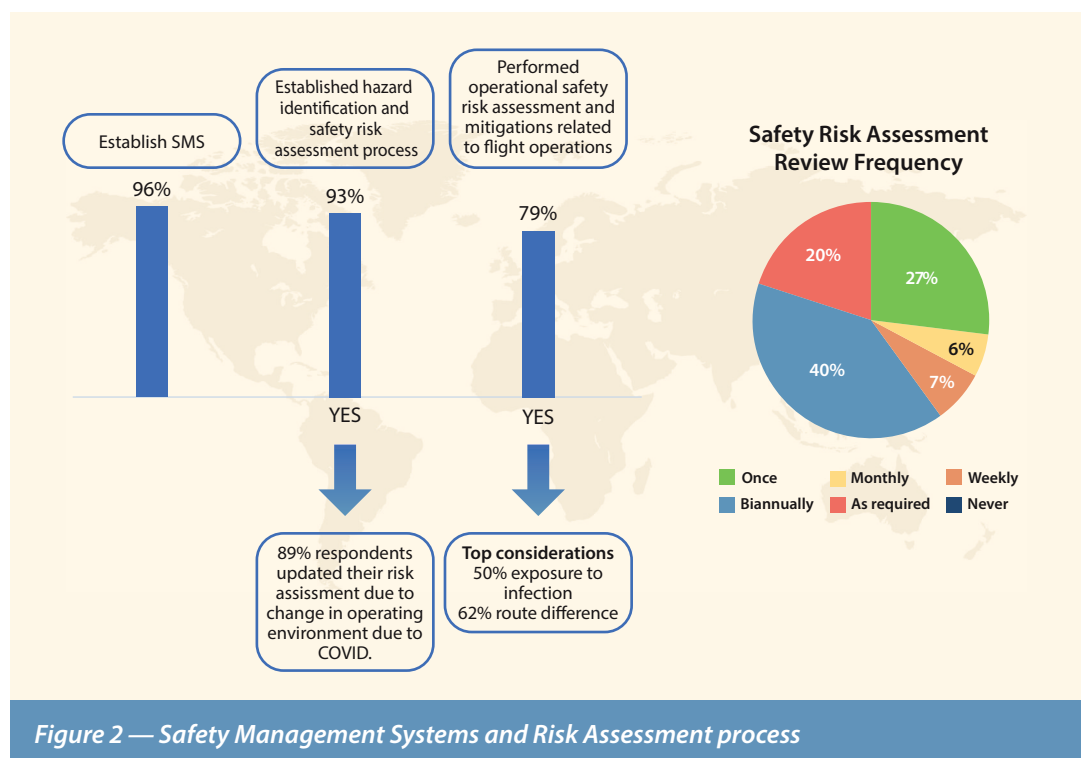
- Organizations that coped better than others had an ERP or a BCP with a consolidated committee of people focusing on how the business should operate during a crisis. A consolidated committee can take many forms, but essentially comprises a technical team and a strategic team working together, ensuring all staff at the appropriate levels are heard and able to speak freely and objectively to ensure effective and safe operations.

4.2 Safety Management Systems and Risk Assessment Process

The commercial aviation community relies on safety management systems (SMS) to detect and monitor undesired events and trends, and proactively implement safety enhancements to reduce risks. The challenges we face to operate safely in the COVID-19 and post-COVID-19 pandemic environments require the industry to develop its safety tools available under SMS to make them robust enough to meet these challenges.

Risk assessments performed by organizations and authorities are made in the context of specific operations and operating environments. The substantially changed and still-changing operating environment and the addition of new types of operations mean that most risk assessments needed to be reviewed, validated or updated accordingly.

These include issues such as the risk of skills and knowledge degradation due to lack of recent practice, the wellbeing of aviation professionals, the impact of long-term storage of aircraft and the overall effects of reduced finances on safety, including loss of suppliers and the loss of operational and technical staff.





According to survey results, almost all operators in the region have established an SMS and a hazard identification and safety risk assessment process. Some 89 percent updated their risk assessment due to the pandemic. However, 11 percent did not and may require further follow-up actions.



Risk assessments should be reviewed frequently to ensure that they address any new and emerging risks identified through the operation, especially when we are aware that change management was a constant during the pandemic. Thirty-three percent of the operators reviewed their risk assessment as required, weekly or monthly (compared with the global average of 60 percent), but it still means that 67 percent did not review it routinely during the pandemic. (This is much lower than the global average.)

Top considerations when performing safety risk assessments were::

Exposure to infection (50 percent) — Airlines would classify each route according to the level of risk of exposure to COVID-19 in order to determine whether additional mitigations were required in relation to services, policies or procedures.

Route Differences (62 percent) — Airlines would conduct a risk assessment for all routes and overflight rights, including any temporary filed differences to existing ICAO standards and recommended practices, and assess whether those differences were accepted by countries along the planned routes and the destination country. While most countries filed their acceptance of differences from other countries, not many states have made their exemptions public.

In flight operations, it is recognized that new standard operating procedures (SOPs) would be introduced during the pandemic, such as SOPs on revised routes, approaches, dealing with in cabin cargo, new health measures, etc.

All the operators surveyed indicated that they performed a risk assessment for each new SOP during the pandemic. (This is much higher than the global average.)

Key Outcomes

- Evidence-based risk assessments were limited in some of the decision-making processes.
- There was a need for quick implementation of mitigation measures in existing procedures or rapid integration of new procedures.
- There was a need to continually assess risks associated with exposure and delays.
- Operators were challenged with the myriad of changes to national requirements from one state to the next.
- Some operators were required to establish the strictest standards to ensure they would satisfy the requirements in the majority of states in which they operated.
- Medevac flights were forced to review SOPs and risks every two days, due to the rapidly changing landscape.
- Flight crews of all sizes of operations risked exposure to infection.
- Many jurisdictions' health requirements were not available to flight crew until they were on site.
- With respect to SMS implementation, generally, large operators have implemented SMS, but small operators experienced challenges.
- Operators of all sizes had to function with SMS during the pandemic and small operators found it challenging to implement SMS.

- Many operators have further matured their SMSs and adjusted them to account for pandemic-driven changes, thus helping to ensure safe operations.
- Evidence from the assessment has confirmed that smaller operators in many cases saw their level of activity increase during the pandemic, not only for cargo operations but also for specialty operations including offshore and medevac flights. Those operators faced similar challenges as large operators, including similar risks, and were required to perform risk assessments on a regular basis.
- The return to normal operations resulted in an increase in events from the flight data analysis, such as un-stabilized approaches. This was mitigated with earlier simulator training (prior to the scheduled recurrent training). Some of the earlier flights had an extra trainer or instructor on board.
- New SOPs were established by many air operators based on risk assessments, including recommendations from their respective CAAs, ICAO and the World Health Organization (WHO). Many airlines also arranged travel bubbles (agreements between countries, especially those with low COVID-19 case numbers, to open their borders to each other) to facilitate restart operations.
- Special operations/flights had to be done at the beginning of the pandemic to evacuate nationals all over the world, which required special SOPs, evacuation plans, hotel coordination and foreign government coordination. The special SOPs were updated almost monthly during the peak of the pandemic.
- While SOPs were being revisited or updated, operators had to be cognizant that changes should only be introduced when necessary, as significant changes required further training and also created further fatigue for all staff.
- Changes in work processes (such as changing configurations from passenger to cargo, or expansion to freight) required prompt and clear communication, increased surveillance, and spot-checks due to new risks arising from the change in processes as well as residual risks.
- Early efforts on risk assessments became overwhelming and required new SOPs to be defined on a frequent basis to gather information throughout the pandemic.

Key Takeaways

- An SMS is the cornerstone of an effective strategy to prevent hazards from becoming unrecoverable risks. The myriad changes introduced at all organizational levels — slashed schedules, parked aircraft, layoffs, loss of experienced personnel, recruiting new employees to keep pace with recovery and developing COVID-19-related safety and wellness procedures, to name a few—have tested all operators and States' abilities to identify and manage risk resulting from the pandemic-related changes.
- The enhancement of the sharing and exchange of safety information will facilitate the development of safety intelligence for management of safety risks at all levels. Exploring and analyzing lessons learned from existing risk management strategies in all sectors and at all levels helps to build aviation safety intelligence and add to the safety data collection to support the identification of hazards and safety data analysis.
- While the level of SMS maturity varied by operator, the industry has benefited from the fact that most operators have been implementing SMS for more than a decade. Over the past two years, many operators have further matured their SMS and adjusted them to account for pandemic-driven changes, thus helping to ensure safe operations. However, the assessment has revealed the benefits and the need for a review of operational safety

risk assessment process on a routine (frequent) basis, to identify new risks, hazards and mitigations related to flight operations during the pandemic.

- States should consider establishing SMS in a more simplified or scalable approach to cater for smaller operators. Additionally, operators of smaller aircraft should be encouraged to engage with their airline associations and the International Air Transport Association (IATA) to benefit from programs such as the IATA Standard Safety Assessment (ISSA).
- Operators of smaller aircraft are encouraged to receive enhanced training in SMS to augment the safety level capacity.
- There is a need to develop and train more service provider staff in high uncertainty scenario risk assessments. This type of training has proven to be essential for effective decision-making.

4.3 Ability to Monitor and Detect Hazards and Perform Risk Analysis

Hazard identification, risk management, safety improvement and safety performance are the main components of an SMS.

The survey results found that 72 percent of operators indicated that they routinely examine normal safety performance indicator (SPI) reporting and 17 percent do so when alerted about potential issues. However, 11 percent have not collected data or information in this area. This is an area to improve upon since hazard identification and risk management are two of the main components of SMS.

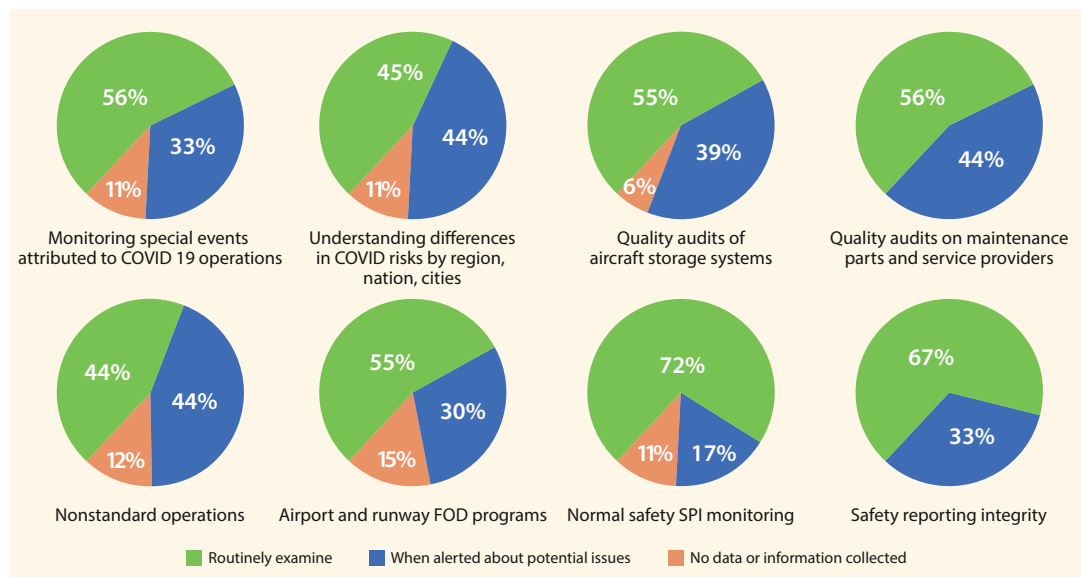


Figure 3 — Ability to monitor and detect hazards and perform a risk analysis during the period of the COVID-19 pandemic

When looking at the chart above, we should strive to improve in the areas where no data or information is collected. For instance, some airports in an operator's network may witness an increase in wildlife activity due to reduced airport operations. Increased vigilance at susceptible airports should be maintained and crews notified accordingly.

Where aircraft have been stored for long periods on taxiways and other areas not built for storage, there may be an increased risk of subsidence and surface damage. Operating crews should be



particularly vigilant and notify air traffic control if any damage is observed outside of published NOTAMs. Seventeen percent of the respondents did not carry out the monitoring and detection of potential hazards for airports.

Eleven percent did not consider differences in COVID-19 risks by region, nation or cities, even though they may have been operating into those areas. Furthermore, 11 percent did not monitor special events attributed to COVID-19 operations.

When looking at the chart related to quality audits of aircraft storage systems, we see that 6 percent of the survey respondents did not collect information in this area. The unplanned mass storage of aircraft for an indeterminate length of time will have introduced many airline maintenance planners to the complexity of storage programs. Aircraft storage in some cases went beyond the standard procedures that original equipment manufacturers (OEMs) describe in their maintenance manuals and required some specific guidance from OEMs, introducing many challenges for maintenance organizations.

Key Outcomes

- During the pandemic, when looking at the four pillars of SMS, many airlines indicated that their internal policies have not changed due to the COVID-19 pandemic; neither has the risk methodology, but greater focus was placed on risk management new emerging risks.
- Risk tolerance had to be reviewed during the pandemic, and new risks were identified through external sources such as ICAO's Council Aviation Recovery Task Force (CART), the IATA and Airports Council International effort called "Safely Restarting Aviation," and the Airbus program "Keep Trust in Air Travel."
- Internal sources in the form of brainstorming and risk assessment sessions were important keys to success.
- Overall, risk assessments were more frequent and more exhaustive in a shorter time span.
- Some of the newly identified risks include COVID-19 contagion, safety events related to pandemic fatigue and homesickness, loss of proficiency due to inactivity periods, and ground damage due to aircraft parking and storage.

Key Takeaways

- Be open to change, act quickly and have a proactive approach.
- Be agile and adaptive in risk management techniques to achieve a safe operation and recovery from the pandemic.

4.4 Change Management

During the pandemic, the shutdown and return to service in the aviation sector have led to many changes to the operating environment. This means that organizations needed to address the management of change effectively and regulators needed to engage with their organizations to ensure that the results are safe and effective.

The aviation system is highly interconnected and sophisticated and made up of people and technology, meaning that the consequences of shutdown and restart are not completely predictable. Organizations will need to prepare good communications and decision-making strategies, using personnel expertise, data, information and good internal and external coordination.

The survey asked a series of questions related to change management to help determine how well organizations' processes and systems kept pace with COVID-19-related changes to company operations.



In the ESAF and WACAF regions, 28 percent of the operators indicated that the change management process was applied across their entire company without exception. Thirty-three percent performed independent assessments as required. However, 39 percent of those surveyed felt that the change management process was inconsistently applied across the company.



Fifty-two percent of the operators felt that they managed to mitigate the risks arising from workforce changes during the pandemic well or exceptionally well.

This includes communications to all staff affected by change, training regarding hazards that were expected during the crisis, as well as new risks of fatigue due to scheduling changes.

However, 48 percent felt that this was handled in an average way or poorly.

Concerning company processes and systems keeping pace with COVID-19-related changes to company operations, 63 percent felt that overall company processes were handled better than usual or exceptionally well.

This would include the handling of pandemic-related changes to IT systems, manual systems, employee safety reporting, hazard identification and risk assessment and safety culture promotion. Hazard identification and safety culture are fundamentals for a strong SMS, so while 60 percent is the global average, there is still room to improve.

Key Outcomes

- Organizations/operators need to review internal controls and processes for change management in light of the transition to the post-COVID-19

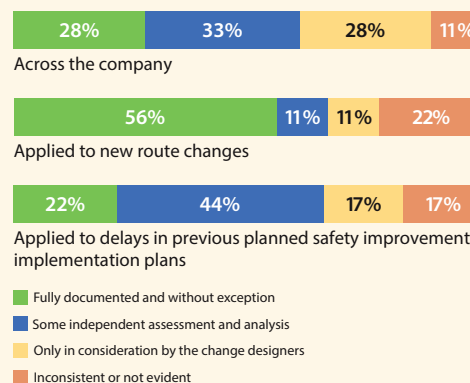


Figure 4 — The change management process applied to an organization

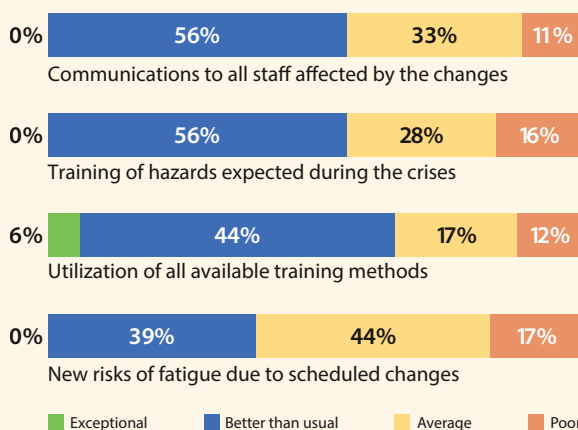


Figure 5 — Ability to mitigate the risks of staff workforce changes

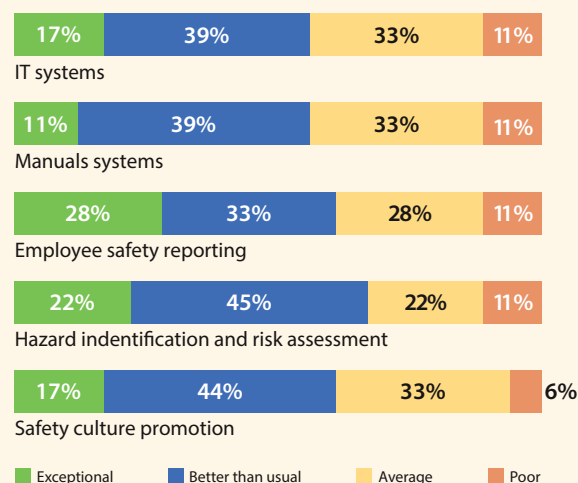


Figure 6 — Keeping pace with COVID-19 related changes to company operations

environment. Any changes to operations should not unintentionally reduce the effectiveness of deployed mitigations. If changes are required, a plan should be provided and special surveillance programs implemented to monitor, identify, and mitigate potential undesired impacts.

- Organizations should continuously promote change management through a safety committee or other forums, with the aim of maintaining a culture of change, and with information being exchanged at all levels.
- Organizations should create multi-disciplinary groups, when necessary, to assess risks from different perspectives. This would ensure a better performance in the implementation of mitigation or control measures.
- The main challenges encountered with change management were the timeline for implementing the change, training all the personnel involved, signing contracts and developing and authorizing procedures or manuals.
- Most of the changes encountered by airlines were due to the pandemic which resulted in an increase in change management processes. Finding new routes and new markets was crucial for operators.
- During the pandemic, most airlines changed their strategic plan and outlook model to move from transporting only passengers to moving passengers and cargo. In many cases, cargo-only flights were being conducted, including charter for cargo. This change in type of operations required extensive coordination and approvals from the regulators.

Key Takeaways

- Organizations need to address the management of change effectively and regulators need to engage with their organizations to ensure that the results are safe and effective. The cooperation and relationship with the regulator are extremely important to ensure a smooth and relatively quick approval process.
- Organizations/operators need to review internal controls and processes for change management in light of the transition to the post-COVID-19 environment. They should ensure any changes to operations do not unintentionally reduce the effectiveness of deployed mitigations. If changes are required, they should provide a plan and special surveillance programs to monitor, identify and mitigate potential undesired impacts.
- It takes visionary thinking to practice good change management and think through all the things that could happen, including the ability to forecast effectively everything related to risk for flight safety and to conduct operational safety risk assessments as appropriate.

4.5 CAA and Industry Cooperation

During the pandemic, ICAO, together with all States and international organizations, quickly launched the CART. ICAO has provided guidance to States on COVID-19 safety operational measures, particularly on the issuance of alleviations as well as exemptions. Guidance was also developed to be distributed from States to their service providers (operators).

CAAs have also been granting flexibility provisions or alleviations considering the capabilities of service providers to demonstrate an acceptable level of safety, while at the same time, CAAs had limited capacity and capability to conduct oversight activities using pre-COVID-19 methods.

Alleviations to the ICAO Standards which should be filed as “temporary differences” were promoted in the initial stages of the pandemic. Since then, more emphasis has been placed on the issuance of exemptions to state requirements, if necessary. Currently, very few States have

active targeted exemptions published with ICAO. Certainly, the number of exemptions issued to operators is much higher. However, during the peak of the pandemic, approximately 46 States (24 percent) filed temporary differences with ICAO, indicating that they have issued exemptions. Based on survey results, the number is probably higher than that.

Targeted exemptions were mainly issued to the following standards (areas):

- Pilot proficiency checks;
- Pilot recency experience;
- Medical examiners; and,
- Certificate of airworthiness renewal.

Operators were asked survey questions to determine the level of interaction/cooperation they had with their CAAs, based on what was called for in the CART recommendations.

The top guidance received by operators from their CAAs during the pandemic related to pilot proficiency checks, pilot recency experience and license validity. Twenty percent indicated they did not receive or request guidance.

Some 61 percent of the operators received targeted exemptions, exceptions or alleviations. As reflected in Figure 7, the area with the highest percentage of targeted exemptions was pilot proficiency checks, with 80 percent receiving targeted exemptions.

Seventy-six percent of operators requested exemptions to address in-cabin cargo solutions, of which 92 percent were approved by the CAAs. Such operations bring additional threats that must be considered and mitigated.

Forty-three percent of operators requested extensions to flight duty periods, of which 100 percent were granted.

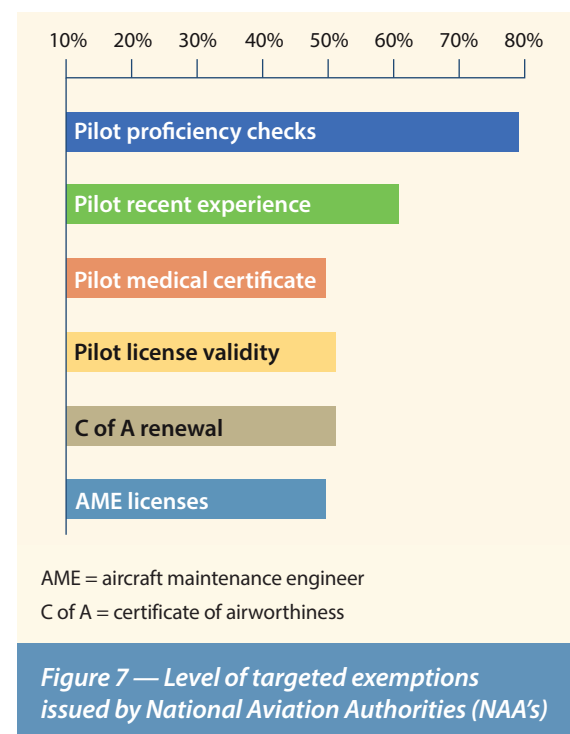
Forty-seven percent of CAAs reduced their periodic inspections during the pandemic. This is consistent with the responses we have seen globally as the CAAs faced challenges and limitations similar to those facing service providers.

Seventy-six percent of the survey respondents participate in industry audit programs, and the majority said such programs adapted very well during the pandemic. Close to 65 percent of the monitoring activities were conducted remotely and close to 20 percent were hybrid operations.

Only 6 percent of operators indicated that the level of communication between regulator and operator was reduced during the pandemic.

Key Outcomes

- A collaborative decision-making process between regulator and operator proved successful. Some States established industry committees comprised of airlines, airline



associations and airport operators to devise strategies to cope with the impact of the pandemic on aviation. That helped to serve as a coordination mechanism among the civil aviation industry and health authorities to support the prompt identification of a fast recovery once demands started to return to normal levels. The committee focused on identifying alleviation measures and coordinating communication strategies to gain passenger confidence in air transport.

- The establishment of a collaborative safety team (CST), in particular within the SAM and NACC regions, enhanced the information-sharing needed during the pandemic between the regulator and service providers.
- We witnessed examples of good safety management practices across regulators and industry that facilitated the ability to make risk-informed decisions by assessing the situation and devising strategies to alleviate some overly prescriptive requirements while at the same time ensuring risks were maintained at acceptable levels.
- Extensive coordination and cooperation were triggered between industry, State, international organizations and OEMs.
- Some regulators issued safety bulletins in line with IATA guidelines, which significantly helped the industry.
- In the majority of cases, communications with the regulator were enhanced during the pandemic. Particularly when exemptions were requested, regulators provided additional guidance on mitigating measures.
- Regulators were required to publish the temporary exemptions as differences as promoted by ICAO in order to facilitate air operators' routes across borders. However, the number of published differences were far fewer than the temporary exemptions that were issued.
- The regulator and industry service providers have been severely impacted in the past couple of years by the pandemic. With this, risks were introduced at all levels.
- Fewer on-site visits were performed by regulators. However, an increase in virtual monitoring activities was introduced. While virtual monitoring has been beneficial, it does not replace the benefits of on-site visits; however, it is complementary.
- There is a need to harmonize world health requirements between States and within States. A more harmonized approach is needed to ensure a standardized approach to dealing with health requirements versus the requirements directed by aviation ministries and the World Health Organization (WHO).

Key Takeaways

- CAA and industry cooperation was enhanced. However, everyone (regulator and industry) has been severely impacted these past couple of years and new risks have been introduced at all levels.
- CAA oversight has been reduced, with fewer on-site visits or, in many cases, an increased time interval between checks. To compensate, virtual visits increased, as did communications (in some cases) and the issuance of temporary exemptions. Occurrence data collection has been reduced in proportion to reductions in traffic. Furthermore, data analysis may have been impacted with the loss of expertise (temporary or permanent) in this area by both the regulator and industry. This creates a risk that we must consider.
- Managing the many waivers and exemptions issued to enable the industry to survive the pandemic and begin recovery should be an area of extra focus as state safety programs mature over the next several years.

- The level of maturity of safety management processes varied considerably between operators and regulators. The industry lacks guidance on a pathway to a mature safety management process. The industry could benefit from a road map on building a mature SMS process.

4.6 Human Factors/Crew Resource Management/Mental Health

Throughout the pandemic, service providers and regulators were impacted by human factors issues that needed attention, during either crew training or on-board operations. Generally, all staff from all departments were at risk of being impacted. Some of these issues may adversely affect individual and group performance as well as introducing additional safety risks.

Some of the most relevant issues that have been identified throughout this pandemic were:

Increased stress was the top response, with 61 percent of survey respondents reflecting a high stress level due to non-standard operations, constant change and revisions to SOPs.

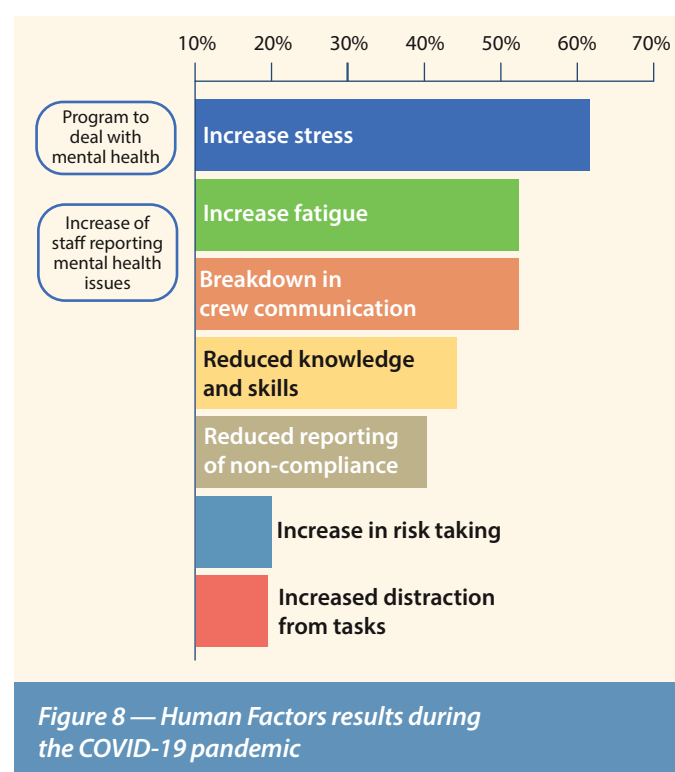
Increased fatigue — Returning to work following a long period of inactivity and/or isolation, and increased alertness to ongoing fears and concerns around employment, infection, protection, finances, news and media all can contribute to an increase in fatigue. Fifty-four percent of survey respondents indicated this was a concern.

Breakdown in crew communication and alignment — A loss of effective flightdeck CRM due to misalignment in constant procedural changes related to health and operational documentation or procedures that may be country- or airport-specific.

Some 54 percent of respondents reflected this concern. Workshop respondents indicated that various new SOPs were added to mitigate some of these concerns involving crew scheduling and pairing processes to better manage the influx of new workforce members.

Reduced knowledge and skills — This occurs when flight crews have been removed from the role for an extended period of time. Any extension of recurrent training validity may impact their current knowledge levels, and multiple changes to procedures on a regular basis may cause confusion. This issue also applies to all staff, in particular these with specialized skill sets. Forty-six percent of survey respondents indicated this was a concern.

Reduced reporting of non-conformities — Crew may be less confident about reporting non-compliance with procedures in case of consequences, including loss of employment for themselves and/or others. Forty-three percent of survey respondents indicated this was a concern.





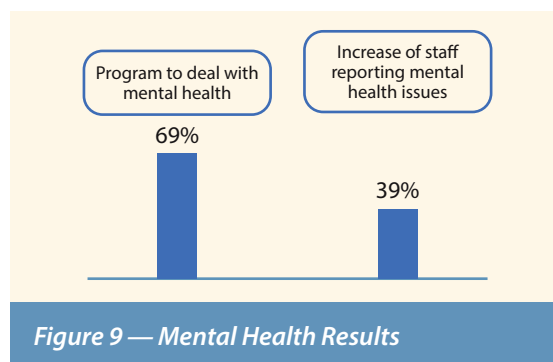
Increase in risk-taking — When flight deck crews are fearful of losing their jobs, they may take more risks to protect the operation. Twenty-three percent of survey respondents indicated this was a concern.



Thirty-nine percent of respondents indicated that there was an increase in staff reporting of mental health issues during the pandemic.



While there is no ICAO requirement and perhaps no national requirement, 69 percent of survey respondents have indicated that their airline has a program in place to deal with mental health issues.



Key Outcomes:

- We need to strongly encourage a robust safety reporting culture with special emphasis on safety-related issues in the COVID-19 and post-COVID-19 pandemic environment.
- Organizations should pay close attention to fatigue reporting and actively support reporting of fatigue and other occurrences via a strong just culture.
- Consider that personnel returning to the workforce and those who continued working through the pandemic may be under higher-than-normal levels of psychological stress.
- Organizations and regulators need to understand the sources of aviation professionals' fear, increased stress, and distraction, all of which can potentially reduce staff performance levels and impact safety.
- Smaller carriers that do not necessarily have a stress and mental health program should at least have an open communication channel with all staff at all levels.
- Reporting on mental health still carries a bit of social stigma, and more effort is needed to encourage a robust safety reporting culture. Some operators, particularly in the MID and APAC regions, expressed the challenges in allowing an open discussion on mental health.
- The long-term effect of working from home without the human interaction has had an impact on staff mentally.
- Fatigue was an issue when returning to the office, as people have become unaccustomed to the physical working environment.
- The impact of the pandemic has increased stress levels on pilots as they fly less frequently and in a changed environment.
- The launching of confidential peer support programs that act as a support system for pilot crewmembers and their families, while not mandatory, has provided significant benefits. Such programs help detect potential issues with a pilot's state of mental health before it becomes problematic.
- Increase in communication with all staff was an important factor in helping a staff members and crewmembers feel connected with the organization.
- Monitor crew experience to avoid pairing less-experienced crewmembers. Match an experienced crewmember with a less-experienced crewmember to provide enhanced training and mentoring and to reduce potential errors.

- One beneficial tactic was the establishment of peer-to-peer groups to provide technical support to staff, just to keep everyone aware of operations, particularly during down time during the pandemic.
- Organizations and regulators need to understand the sources of aviation professionals' fear, increased stress, and distraction, which can potentially reduce staff performance levels and impact safety.

Key Takeaways

- The pandemic has had an extensive impact on the well-being of aviation professionals across the industry. The Foundation urges all stakeholders to assess these impacts and mitigate them in their safety programs, and to make the appropriate resources and support available to all personnel.
- Human factors and issues of mental health have impacted all organizations. This requires not only effective mental health programs for staff but also for measures to be put in place to reduce the possibility of these issues arising.
- Risks can be introduced when staff resources are disrupted, especially when highly specialized staff are impacted. Crew resource management, in particular, would be impacted by disruptions.