ALTA

FLIGHT SAFETY FOUNDATION

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Regional Aviation Safety Assessment Project

South American, North American, Central American and Caribbean 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.

Developed in collaboration with regulators, regional groups and industry associations, the assessment focussed on six International Civil Aviation Organization (ICAO) regions: South American Region (SAM), North American and Caribbean (NACC), Asia and Pacific (APAC), Middle East (MID), Eastern and South African (ESAF) and Western and Central African (WACAF). Traditional safety information was collected in the early months, such as data on accidents, serious incidents and occurrences, and the number of exemptions, extensions and alleviations issued. A deeper 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 the industry, as well as on the industry keeping pace with its international obligations and national requirements.

1. Factoring the Global Pandemic Into the Methodology

The COVID-19 pandemic's impact on the global aviation community has been unprecedented and has 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 to the operating environment. This means that 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 assessment performed was timely and factored in the impact of the pandemic.

2. Safety Information Gathering

In order to collect the needed information from the NACC and SAM region, a survey has been prepared in collaboration with the Latin American and Caribbean Air Transport Association (ALTA) and sent to its members and their associate airlines as well as non-members and associate airlines that are part of the ALTA Safety Committee. The objective of the survey was 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 regulators and service providers. Forty airlines in the NACC and SAM regions participated in the survey.

Flight Safety Foundation and ALTA conducted a virtual workshop on Feb. 22, 2022, in order to perform a deeper analysis of the survey results and exchange best practices and lessons learned among participants. Over 117 participants from airlines, airport groups, regulators, ICAO Regional Offices (NACC and SAM), original equipment manufacturers (OEMs) and international organizations participated in the workshop. The information collected was also shared, when possible, with the Regional Aviation Safety Group — Pan America (RASG-PA) for information as well as validation.

2.1 Survey Content

The comprehensive survey, containing over 60 questions, was prepared in consultation with ALTA 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 key takeaways in each of the six areas reflected above.

3. Summary of Results

Air operators, regulators, ICAO and other international organizations as well as ALTA 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 — South American, North American, Central American and Caribbean 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 of an organization for business continuity (such as reducing staff) may not always involve safety leaders in such decisions or in the assessment of the risks arising from such decisions.

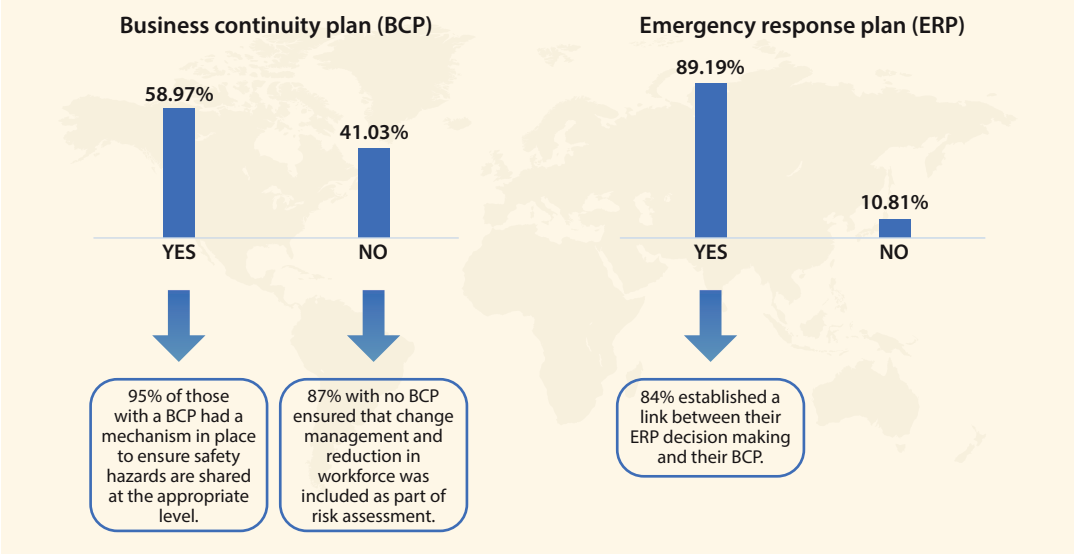

Figure 1 — Business continuity and emergency response plans

Eighty-nine percent of the operators indicated that they had in place an ERP. This comes as no surprise and was expected, considering the ICAO standards and national requirements and all the guidance and best practices that have been previously developed on this topic.

Fifty-nine percent of the operators responded that they had a business continuity plan, which also is not an aviation regulatory requirement; however, large organizations typically would put this in place in case of any form of disaster.

Eighty-seven percent of the operators indicated that change management and reduction in workforce were included as part of the risk assessment. (Ten percent higher than the global average)

An interesting point is that about 15 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 recognized 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 an 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 a BCP to decide where to address the disruption caused by the pandemic. In most cases it was placed under the BCP because the disruption impacted the entire business.
- Some airlines had the advantage of having a BCP established prior to the pandemic, and thus 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 and continuing airworthiness matters; commercial plans (new schedules and marketing plans); training (critical skills gap); an effort not to lose training capability (factoring a staff reduction by 75 percent); and a return-to-work policy (which departments needed to develop for both workers on site and those working remotely).
- At the BCP level, airlines had to address drastic workforce reduction and how to determine the minimization of the workforce, coupled with the logistics of how different functions of the organization would work with a 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 center.

- 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 hand-in-hand, 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 challenge we faced to operate safely in the COVID–19 and post–COVID-19 pandemic environments required the industry's safety tools to evolve 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 meant 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 well-being 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.

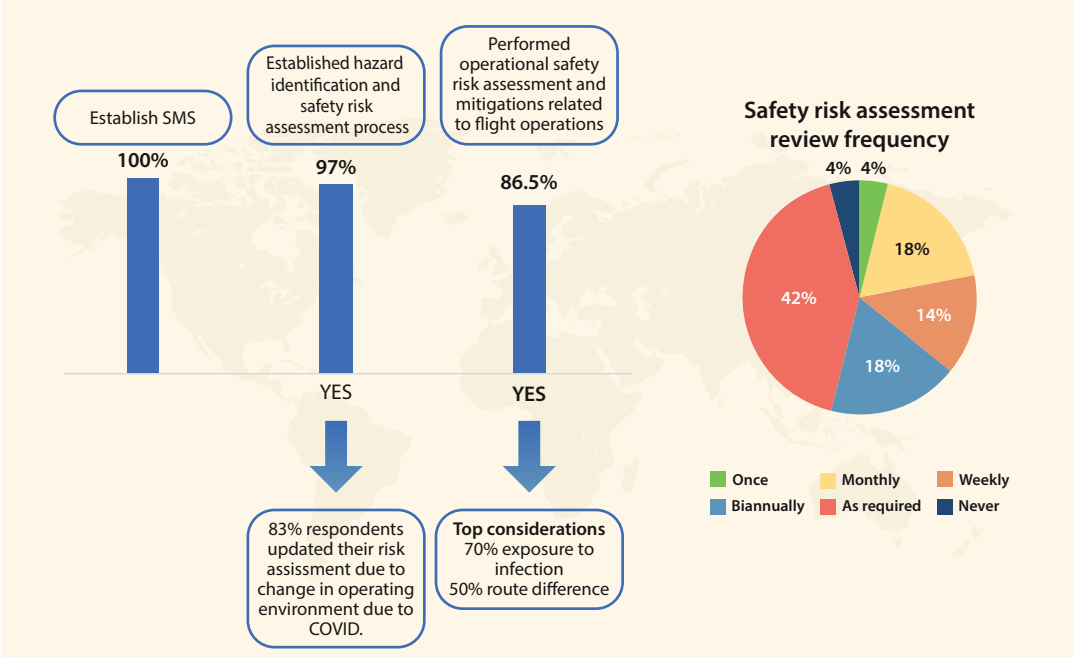

Figure 2 — Safety management systems and risk assessment process

According to survey results, nearly all operators in the ICAO SAM and NACC regions have established an SMS and a hazard identification and safety risk assessment process. Some 85 percent updated their risk assessment due to the pandemic. However, close to 15 percent did not.

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 was a constant during the pandemic. Some 74 percent of the operators reviewed their risk assessment as required, weekly or monthly (greater than the global average of 60 percent), but 26 percent did not review it routinely during the pandemic.

Top considerations when performing safety risk assessments were:

Exposure to infection (70 percent) — Airlines would classify each route according to the level of risk of exposure to COVID-19 in order to determine whether additional mitigations would be required in relation to services, policies or procedures.

Route differences (50 percent) — Airlines would a conduct a risk assessment for all routes and overflight rights, including any temporary filed differences to existing ICAO standards and recommended practices (SARPs), 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, 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.

Sixty percent of the operators indicated that they performed a risk assessment for each new SOP during the pandemic (10 percent less than the global average). Therefore, 40 percent did not, which is an area for further improvement.

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

challenges similar to those of 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 (spike) of events seen in flight data analysis such as un-stabilized approaches. This was mitigated by earlier simulator training (prior to the scheduled recurrent training). Some of the earlier flights had an extra trainer or instructor in the cockpit.
- New SOPs were established by many air operators based on risk assessments, including recommendations from their respective civil aviation authorities, ICAO and the World Health Organization (WHO). Many airlines also arranged to create travel bubbles (agreement between countries, especially those with low COVID–19 cases, to open their borders to each other) to facilitate restart operations.
- Special operations/flights had to be performed 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 additional fatigue for all staff.
- Changes in work processes (such as changing configurations from passenger to cargo,or expanding to include 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.

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 — dramatically reduced 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 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 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. During the pandemic, 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 of, and the need for, a review of operational safety risk assessment processes 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 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 70 percent of operators indicated that they *routinely* examine normal safety performance indicator (SPI) reporting and a further 23 percent do so when alerted about potential issues. Similar percentages would apply regarding safety data integrity. However, there are areas to improve upon.

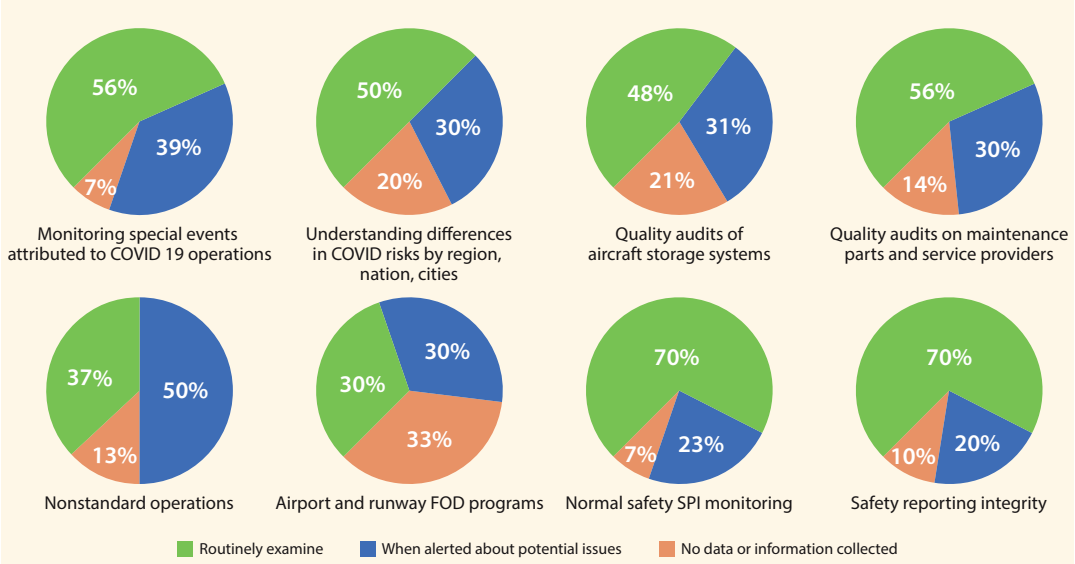

Figure 3 — Ability to monitor and detect hazards and perform a risk analysis during the period of the COVID-19 pandemic

As reflected in the pie charts above, improvements should be made in the areas where no data or information is collected. For instance, some airports on an operator's network may see an increase in wildlife activity (birds, etc.) due to reduced airport operations such as those associated with the COVID-19 pandemic. 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 (ATC) accordingly if any damage is observed outside of published NOTAMs.

Some 33 percent of survey respondents did not carry out the monitoring and detection of potential hazards for airports.

Twenty percent did not consider differences in COVID-19 risks by region, nation or cities, even though they may have been operating into those areas.

When we look at the pie chart related to quality audits of aircraft storage systems, 21 percent of 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 OEMs cover in their maintenance manuals and required 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 COVID-19; neither has the risk methodology, but greater focus has been placed on risk management, which included safety assurance and promotion for the new emerging risks.
- Risk tolerance had to be reviewed during the pandemic — new risks were identified through external sources such as ICAO's Council Aviation Recovery Task Force (CART), IATA (Safely Restarting the Aviation Industry), and Airbus (Keep Trust in Air Travel)
- Internal sources in the form of brainstorming and risk assessment sessions were important keys to success.
- Overall risks 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; and,
- 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, 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 processed — and systems kept pace with —COVID-19–related changes to company operations.

Some 37 percent of the operators indicated that the change management process was applied across their entire company without exception. Another 40 percent performed independent assessments as required. However, 23 percent of those surveyed felt the change management process was applied inconsistently or with minimal consultation.

With respect to workforce changes, overall, 60 percent of the operators believed that they managed to mitigate the risks arising from workforce changes during the pandemic better than usual or exceptionally well. However, this leaves room for improvement since 40 percent felt that this was handled in an average way or poorly, in particular, in the area of training on the specific hazards and mitigating new risks of fatigue due to schedule changes.

Concerning company processes and systems keeping pace with the COVID-19–related changes to company operations; 63 percent felt that overall company processes were handled better than usual, and in some cases, exceptionally well, during the past two years.

However, there is room for improvement, in particular, in the promotion of a strong safety culture, which is a major component of SMS, with 44 percent of the respondents indicating that their organization's handling of this issue was average to poor.

Key Outcomes

- Organizations/operators need to review internal controls and processes for change management in light of the transition to the post-COVID–19 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 their safety committees or other forums,

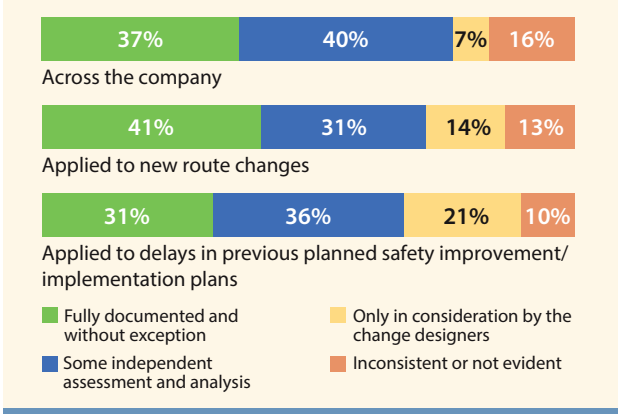

Figure 4 — The change management process applied to an organization

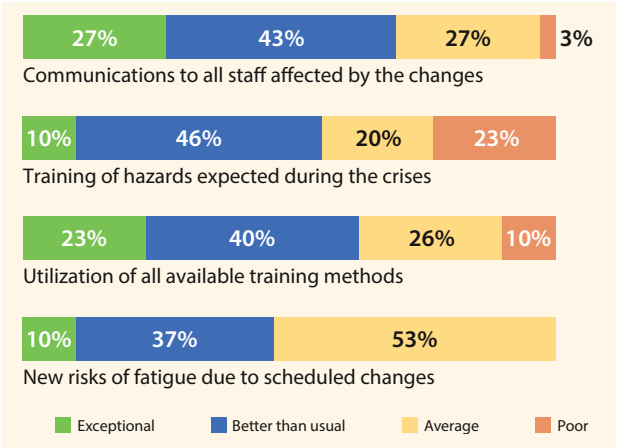

Figure 5 — Ability to mitigate the risks of staff workforce changes

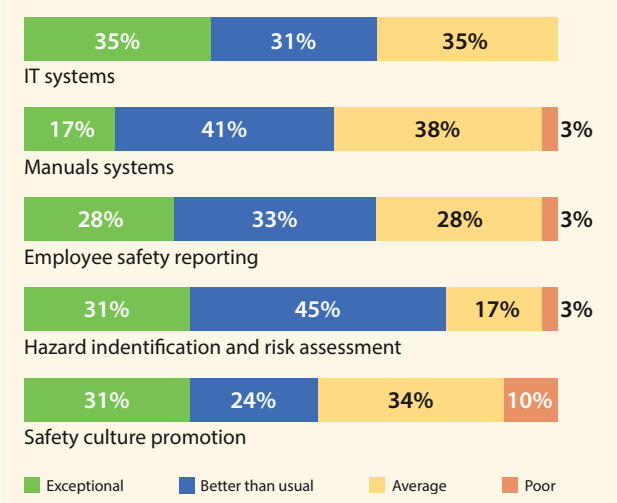

Figure 6 — Keeping pace with COVID-19 related changes to company operations

with the aim of maintaining a culture of change, 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 in which to implement the change, training all the personnel involved, signing of contracts and the development and authorization of 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 the seeking of approvals from the regulators.
- 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, organizations/operators 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 everything 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.

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, organizations/operators 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 everything 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).

Civil aviation authorities (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 COVID-19. 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 actually 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.

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

- Pilot proficiency checks;
- Pilot recency experience;
- Pilot area, route and aerodrome recency (ARA);
- Pilot medical certificates; and,
- Pilot license validity.

Operators were surveyed to determine the level of interaction/cooperation they had with their CAA 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 medical certificates, pilot proficiency checks and license validity. Eighteen percent indicated they did not receive or request guidance.

Some 65 percent of the operators received targeted exemptions, exceptions or alleviations related to the above.

Forty-six percent of operators requested and received exemptions to address cargo in cabin solutions.

Thirty-one percent of operators requested extensions to flight duty periods, of which 70 percent were granted.

Sixty-three 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.

Eighty percent of the survey respondents participate in industry audit programs, and the majority said that such programs adapted very well during the pandemic. Close to 70 percent of the monitoring activities were conducted remotely and close to 20 percent were hybrid operations.

Some 37 percent of operators indicated that the level of communication between

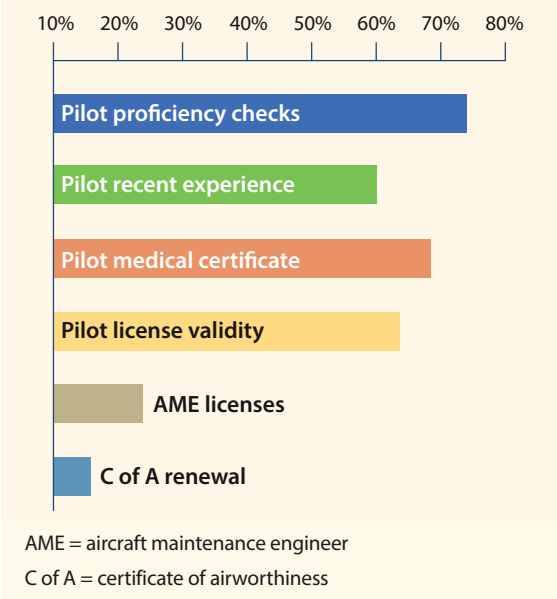

Figure 7 — Level of targeted exemptions issued by National Aviation Authorities (NAA's)

regulator and operator was reduced during the pandemic; this was much higher than the global response.

Key Outcomes

- A collaborative decision-making process between regulator and operator was proven 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. 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 region, enhanced the information-sharing needed during the pandemic between the regulator and service provider.
- We witnessed examples of good safety management practices across the regulator and industry that facilitated the ability to make risk-informed decisions by first 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. Regulators provided additional guidance on mitigating measures, particularly when exemptions were requested .
- Regulators were required to publish the temporary exemptions as differences as promoted by ICAO to facilitate air operators' routes across borders. However, the number of published differences were far less than the temporary exemptions that were issued.
- The regulator and industry (service provider) have been severely impacted by the pandemic. With this, we have to recognize that risks were introduced at all levels.
- Fewer on-site visits were performed by the regulator. 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.

Key Takeaways

- CAA and industry cooperation was enhanced. However, we must recognize that everyone (regulator and industry) has been severely impacted these past couple of years and with this, we have to recognize the introduction of new risks at all levels.
- CAA oversight has been reduced, with fewer on-site visits or in many cases, an increased time interval between checks. This was compensated for by the performance of virtual visits, increased communications (in some cases) and the issuance of temporary exemptions. We have to recognize that occurrence data collection has been reduced in proportion with

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 (SSPs) mature over the next several years.
- The level of maturity of safety management processes varied considerably between operators as well as regulators. The industry lacks guidance on a pathway to 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 have been impacted by human factors issues that needed attention during crew training or onboard 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.

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

Increased stress — This was the top response, with 56 percent of survey respondents reflecting a high stress level due to non-standard operations, constant change and revisions to SOPs.

Reduced knowledge and skills — This occurs when flight crew 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 applies to all staff, in particular those with specialized skill sets. Some 48 percent of survey respondents indicated this was a concern.

Increased fatigue — Returning to work following a long period of inactivity and/or solation. Increased alertness to ongoing fears and concerns around employment, infection, protection, finances, news and media all can contribute to an increase in fatigue — 52 percent of survey respondents indicated this was a concern.

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

Some 32 percent of respondents reflected this concern. Some survey respondents indicated that various new SOPs were added to mitigate some of these concerns dealing with crew scheduling and pairing processes to better manage the influx of new workforce members.

Figure 8 — Human Factors results during the COVID-19 pandemic

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

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

Some 37 percent of respondents indicated that there was an increase in staff reporting mental health issues during the pandemic.

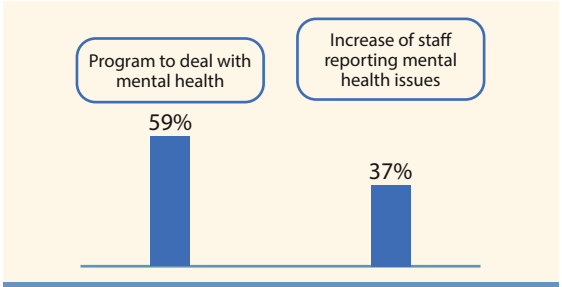

Figure 9 — Mental Health Results

While there is no ICAO requirement and perhaps no national requirement, 59 percent of survey respondents have indicated that their airline has a program in place to deal with mental health issues. These results are pretty much aligned with the global average.

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 region, expressed the challenges in allowing an open discussion on mental health.
- The long-term effect of working from home without 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 early, before it becomes problematic.
- Increased communication with all staff was an important factor in helping 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 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 disruption.