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If you would like to subscribe, please click on the following link [Subscribe](#).

The views and opinions expressed in this quarterly forum are those of the authors and do not necessarily reflect the official policy or position of the FAA, editor, or quarterly forum staff.

Upcoming Events

Do you know of an event that you would like us to share?
Send information to Janine King at janine.ctr.king@faa.gov.

Editor's Note: These events may have been cancelled or postponed due to the COVID-19 pandemic. Please consult the event website for confirmation before planning to attend these events.

73rd Annual International Air Safety Summit

[Virtual Event \(October 19-22, 2020\)](#)

MRO Transatlantic (MRO America 2020 + MRO Europe 2020)

[Virtual Event \(October 27-29, 2020\)](#)

Military Aviation Logistics and Maintenance Symposium (MALM)

[Virtual Event \(November 17-18, 2020\)](#)

Engine Leasing, Trading and Finance

[London, UK \(November 10-11, 2020\)](#)



We're Taking Submissions

Want to share an article or experience in an issue of the FAA Aviation Mx HF Quarterly?

The Mx HF Quarterly is published every 3 months, beginning at the end of March. We welcome your articles related to aviation maintenance. Our great editorial team will review submissions to ensure that content and format meet the needs of our readers. Editorial feedback is subject to author approval prior to the publication.

Please include the following with your submission

- ✓ Short author biography (50-150 words)
- ✓ Photo of yourself for biography
- ✓ One-sentence summary of your article
- ✓ Images and/or graphics (with captions)
- ✓ Call-out quote(s)
- ✓ Takeaway message - what you hope the readers takeaway from your article (do not exceed 100 words)

Send your submissions to Janine King at janine.ctr.king@faa.gov.

Author Appreciation

We, the editorial team, extend our gratitude to our readers and contributors for their continued support of this quarterly publication. Our contributors and authors are not primarily responsible for writing articles for this quarterly newsletter; however, their vast knowledge and understanding of issues impacting and relating to aviation maintenance substantially improve this publication.

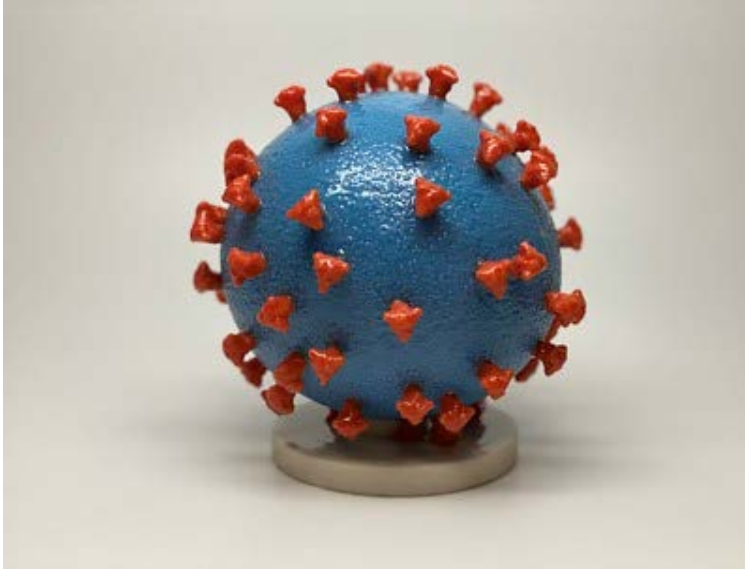
If you are interested in providing suggestions or feedback concerning this publication, or would like to submit an article or notify us of an upcoming event, please email Janine King at janine.ctr.king@faa.gov or Dr. Bill Johnson at Bill-Dr.Johnson@faa.gov.

We look forward to new article submissions, and reviews and feedback from our readers.

We appreciate your input!

Industry Perspectives during COVID-19

We know the aviation industry is dramatically affected by the COVID-19 pandemic, with estimated losses as large as 25 million jobs and \$252B USD globally ([International Air Transport Association](#), April 2020). The new demands introduced by COVID-19 are likely pushing the safety margin and introducing above-normal level of risk for individuals and organizations to manage. Unfortunately, the worst may be yet to come in the United States, as the \$50B USD government bailout that previously supported airlines to continue operating, expired earlier this month. Therefore, in the United States, the loss associated with the pandemic have yet to be fully felt.



Model of Novel Coronavirus

That's why we dedicated this issue of the Quarterly to industry perspectives on COVID-19.

We invited stakeholders to share their stories, challenges, and lessons learned for managing COVID-19 risks. This issue contains contributions from nearly every segment of the industry, including certificate holders, manufacturers, organized labor, and academia.

Following this issue, we will publish a Special Issue written by FAA personnel and human factors researchers, providing evidence-based resources for managing COVID-19 risks.

We wish you all good health and safety during these trying times.

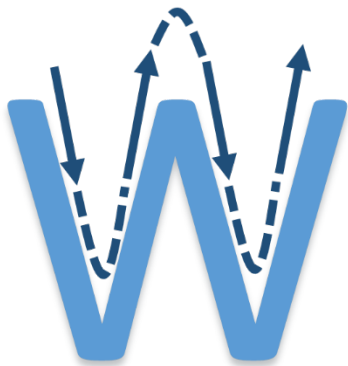
What's Your Contingency Plan for Shutting Your Business Down Again?

Lessons from Cockpit Go-Around Procedures

Dr. Marc Szepan

"WHEN A REOPENED BUSINESS NEEDS TO BE SHUT DOWN AGAIN OR WHEN IT CAN SAFELY CONTINUE TO OPERATE SHOULD NOT BE A MATTER OF AD HOC, "INTUITIVE" OR SUBJECTIVE DECISION-MAKING."

Reopening after having had to shut down due to COVID-19 is proving to be a non-linear journey for many businesses. Instead of arriving smoothly at their new post-COVID-19 destination, many businesses leaders find themselves in the situation of having to abort the first landing attempt and having to execute an organizational go-around. This article discusses six standard practices that can be at the heart of contingency planning for shutting back down a newly reopened business.



W – Shaped Recovery

The COVID-19 pandemic has turned from a health crisis into the most severe economic disruption since the Great Depression. Entire economies have experienced large-scale lockdowns and many businesses were forced to shut down. At the

beginning of the COVID-19 crisis, there had been hope for a V-shaped recovery. The economy was assumed to bounce back quickly, strongly, and linearly. In contrast to these initial hopes, in reality, recovery from COVID-19 is proving to be a much more non-linear, W-shaped journey. Upon reopening after often lengthy shutdowns, secondary COVID-19 outbreaks have forced many businesses to severely curtail their activities or to shut down entirely once again. This non-linear, W-shaped, and possibly multiple W-shaped journey is likely to continue for some time.

Organizational Go-Around

Leaders of aviation and others businesses would be well advised to think about contingency planning in case of having to shut back down a recently reopened business, possibly due to a secondary COVID-19 outbreak. In aviation lingua, rather than counting on take-off being invariably followed by a smooth landing at the destination aerodrome on first approach, business leaders might want to be prepared for executing a go-around after having to abort the first landing attempt. Fortunately, cockpit procedures for performing go-arounds are well-developed. This article suggests six standard practices derived from cockpit go-around procedures that businesses should consider when preparing for a potential secondary shut-down of a newly reopened business.

Six Standard Practices for Managing an Organizational Go-Around

1. Be explicit about decision-making criteria!
2. Put in place a clear and concise go-around procedure!
3. Brief go-around procedure prior to landing!
4. Beware of “get-there-itis”!
5. Power up to ensure safe climb!
6. Maintain a non-punitive culture!

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1. Be explicit about decision-making criteria for going around! In the context of cockpit policies, criteria for determining when a go-around should be initiated are well-defined. Reasons for going around include, but are not limited to, ATC orders, unstabilized approaches, loss of separation, wind shear, and runway incursions. Business leaders would be well advised to achieve similar clarity of decision-making criteria. When a reopened business needs to be shut back down or when it can safely continue to operate should not be a matter of ad hoc, “intuitive” or subjective decision-making. As much as possible in a dynamic crisis situation such as the COVID-19 pandemic, decision-making should be driven by risk-based, clearly formulated, and transparently communicated criteria.

“DETAILED ORGANIZATIONAL GO-AROUND PROCEDURES SHOULD BE DEVELOPED AS PART OF REOPENING CONTINGENCY PLANNING PRIOR TO REOPENING.”

2. Put in place a clear and concise go-around procedure! One of the mainstays of aviation safety is the use of standard operating procedures. These include the go-around procedure which spells out actions to be initiated by the cockpit crew when executing a go-around. Businesses would benefit from clear and concise codification of go-around tasks, sequence in which tasks are to be executed, and task-sharing responsibilities when having to shut down a business again after reopening. This organizational go-around procedure should take into consideration all stakeholders, including employees, contractors, customers and users, suppliers, other business partners, and the local communities in which a business operates. Detailed organizational go-around procedures should be developed as part of reopening contingency planning prior to reopening.

3. Brief your go-around procedure prior to landing! Standard cockpit policies include a discussion of the go-around procedure as part of the descent-and-approach briefing. In general, the go-around procedure can be re-briefed among the cockpit crew prior to final approach or, if practical, when completing the landing checklist. Businesses should aim to disseminate – and, if necessary, to formally train – their organizational go-around procedure

amongst all relevant stakeholders prior to reopening a business in the first place. In addition, there usually is value in refreshing knowledge of standard operating procedures in appropriately spaced intervals after reopening a business.

4. Beware of “get-there-itis”! A number of tragic aviation accidents have resulted from the cockpit crew’s focus on landing at the desired destination aerodrome while inadvertently ignoring or discounting risk factors such as unfavorable weather which would have suggested to initiate a go-around. Contributory factors to such tragic accidents have included fatigue and stress. Often, the decision whether to continue with reopening a business or whether to shut it down again, even if only partially so, has material bearing on the viability of the business as a provider of good, services, and employment. It usually results in considerable commercial and personal pressure on and thereby stress for business leaders. In these circumstances, even the best leaders can easily fall into a “get-there-itis” trap instead of initiating a go-around. Business leaders would be well advised to maintain maximum alertness with regards to early indications of organizational target fixation or tunnel vision when restoring a business after a COVID-19-related shutdown.

5. Power up to ensure safe climb! In general, going around is a standard maneuver that cockpit crew practice regularly in simulators. Once the decision to go around has been made, the cockpit crew needs to set and check go-around power without delay, while monitoring pitch and overall aircraft performance. Similarly, in the business world, success of an organizational go-around is contingent upon taking

quick and decisive action once the necessity to go around has been determined. Businesses that find themselves in the unfortunate situation of having to shut back down or at least to limit their business activities after a recent reopening need to power up quickly and avoid crashing due to haphazard organizational commitment and prioritization.

6. Maintain a non-punitive policy! In general, world-class aviation organizations maintain non-punitive cultures. More specifically, well-managed air carriers do not take disciplinary action against cockpit crew for deciding to go around. In addition, flight operations leadership takes great care to not create unintended perverse incentives above and beyond formal sanctions, for example, due to tonality of feedback after a go-around. Senior corporate leaders and Boards should adopt similar non-punitive policies for cases in which, with the benefit of hindsight, an organizational go-around has been initiated prematurely. Doing so would empower business leaders to execute an organizational go-around when needed. Erring on the side of caution in the interest of stakeholder safety should not be inadvertently de-incentivized, let alone be penalized.



***“ERRING ON THE SIDE OF CAUTION IN THE
INTEREST OF STAKEHOLDER SAFETY SHOULD
NOT BE INADVERTENTLY DE-INCENTIVIZED,
LET ALONE BE PENALIZED”***

In Conclusion

The COVID-19 crisis is likely to affect entire societies and individual businesses for some time to come. In light of secondary outbreaks in a number of countries, economic recovery from COVID-19 is proving to be a non-linear, W-shaped journey. As a

result, many businesses are forced to shut back down or at least severely limit their activities, not long after reopening. This article suggests six standard practices derived from cockpit go-around

procedures that businesses might want to consider to prepare for their own organizational go-arounds, should such difficult decision become necessary.

TAKEAWAY MESSAGE

ECONOMIC RECOVERY FROM COVID-19 IS PROVING TO BE A NON-LINEAR W-SHAPED JOURNEY. AS A RESULT, MANY BUSINESSES ARE FORCED TO SHUT BACK DOWN, OR AT LEAST SEVERELY LIMIT THEIR ACTIVITIES, NOT LONG AFTER REOPENING. THIS ARTICLE DISCUSSES SIX STANDARD PRACTICES DERIVED FROM COCKPIT GO-AROUND PROCEDURES THAT CAN BE AT THE HEART OF CONTINGENCY PLANNING FOR SHUTTING BACK DOWN A NEWLY REOPENED BUSINESS IN CASE OF SECONDARY COVID-19 OUTBREAKS.

Dr. Szepan recently published additional guidance for restarting businesses after COVID-19 in Aviation Pros. Find his article [here](#).

Dr. Marc Szepan is a Lecturer in International Business at the University of Oxford Saïd Business School. Previously, he was an executive at Lufthansa. His primary professional experience has been in leading technical and digital aviation businesses in Europe, Asia, and the U.S. Most recently, he served as Senior Vice President, Airline Operations Solutions, at Lufthansa Systems, the IT services business segment of Lufthansa. He also held leadership roles at Lufthansa Technik, the MRO business segment of Lufthansa, and for two other German industrial companies. In 2012, Marc was recognized as one of *Aviation Week & Space Technology's* "40 Under Forty: Rising Stars of Aerospace and Aviation". Marc received a doctorate in Management Studies from the University of Oxford. He also holds an AM from Harvard University and an MBA from Duke University.



COVID-19 from an AMT's Perspective

John Hall

Editorial Note. *The editors appreciate the straightforward communication style and sincerity of this article. In personal communication with us, the author commented, "... Mechanics are getting sick, mechanics are on ventilators and mechanics are dying. There isn't time to sugarcoat this issue. I spoke to the truth. My name is John Hall. I am proud to have been a member of the International Association of Machinists for over 30 years. I stand by what I wrote."*

Airlines have historically been the leading indicator of our country's economic health. It is no different with this pandemic. We are on a roller coaster. We will recover. We always have.

As an AMT, I noted that our company and union recognized the danger of the COVID-19 virus early. They have worked in a collaborative manner to protect their employees and members of the flying public.

Reactions

After Congress passed the Payroll Support Program as part of the CARES Act, the airlines received approximately \$65 billion in funding with certain employees receiving a no layoff or furlough guarantee through September 30, 2020.

- *The northeast United States was hit early and hard by the virus; consequently, the airlines and mechanics were hit hard. Our company took quick action to put processes and practices in place to lessen the impact at the start of the pandemic. Such practices included: Mandatory wearing of masks in all buildings including offices, hangars, and terminals. Masks are also to be worn when working on thru-flight aircraft and outdoors when social distancing cannot be maintained.*
- *Most stations take temperature readings of all employees entering the work areas. These are either at an entrance gate leading to the airport operations area (AOA), the entrance doors to the hangar, and one station even checks while you're still in your car when entering the parking lot.*
- *High temperatures (101.3) are sent home with pay. If high temperature is detected, second and third readings are taken within 15 minutes of each other. If a high temperature is still detected after the third attempt, the employee is sent home and held out of service until cleared by their doctor.*
- *All of the maintenance staff, support offices, and cubicles have limited their seating to maintain a 6-foot separation. Masks can be taken off once in the cubicle, but are to be worn at all other times.*
- *The maintenance stations have staggered the start and stop times and have staggered the break times at some locations.*
- *There has been an increased heavy cleaning schedule for offices and break rooms.*
- *Vehicle and ground equipment are being cleaned and disinfected at most of the larger hubs.*
- *Tow drivers are now being assigned to a specific tug for the shift. This ensures the same AMT uses the same tug and headset for the shift, lessening the chance of spreading the virus at the hubs.*
- *Increased masks, gloves, and hand sanitizers have been made available. Initially, there was a shortage but the company quickly found a supply.*
- *The terminating aircraft are disinfected with backpack sprayers or foggers.*

- *The company has also been offering voluntary short-term furlough at half pay and early retirement.*

Some of the airports have also put processes in place.

- *A few will issue tickets for not wearing masks. For example,*
 - *Issuing a warning for the first violation; the second violation is a fine of up to \$1,000.*
 - *Issuing a warning for the first violation and a one-day revocation of your airport ID on second. If you still haven't learned your lesson, the airport will take your badge for 10 days on the third violation.*
 - *A three-step process at their AOA entrances into the airport. First, they will take your temperature, and then you're interviewed by a second person to see if you have any symptoms, and finally you are directed to a hand washing station to use before you are allowed into the airport.*

Unfortunately, our airports are operated like independent fiefdoms. The airports are controlled by local governments and the FAA. When the FAA sends out bulletins regarding COVID-19 response to the airport operators they use words like *should* or *recommended*, not *will* and *must*. Without strict guidance from the FAA, this process leaves a lot of differing interpretations and policies, especially in those states where the response to the virus has been slow or lacking.

Negative Consequences of Pandemic

- *Flight schedules were slashed, as much as 70% on domestic route and 80% on international flights.*
- *Some of the aircraft fleets and older aircraft were sold off. Most of the remaining aircraft were parked. They were put into either short- or long-term storage.*

- *Approximately 30% of maintenance management and support staff (non-union) were furloughed or offered retirement.*
- *Morale is lower due to job uncertainty over the September 30 deadline of the CARES Act.*

Unexpected Consequences

- *The AMTs have had more time to accomplish their required Computer Based Training (CBT) courses.*
- *At airports with parked aircraft, there is now access to a cache of ratable parts that can be robbed (borrowed) if they are not in stock (NIS).*
- *There is now a ready supply of replacement aircraft to switch out with a grounded aircraft following a quick-inspection job card.*
- *Non-rev (or standby) travel for airline employees and their families was up due to the near empty flights. However, depending on the destination, this type of travel may have increased their risk of exposure. Upon return, this caused increased anxiety among fellow employees who work in close contact.*

***“THIS VIRUS FLOURISHES ON WARM BODIES
AND IGNORANCE.”***

Closing – Moving Forward

Some of the stations and hangars are reporting high mask usage. I believe this outcome is from the combined reinforcement from management and peer pressure. Unfortunately, not all employees are as aggressive as others. Many have said that they follow the protocols using the masks and social distancing around terminals and in hangars and shops. However, they remove masks when they return to their 'ready' or break rooms. One friend of mine told me that, "it is rare to see a mask being worn in the hangar."



Our company has set standards for our safety in dealing with this pandemic. Unfortunately, some stations are choosing to enforce these protocols independently. Our company will not release the numbers of mechanics who tested positive or were hospitalized; however, whatever the numbers are, they likely would have been much higher without the protocols that were put in place. The problem now is that some are starting to become lax or experience operational drift as time goes by. At one station, they are only doing the temperature checks at 12 of the 24 entrances, another only does the temperature checks on first and second shifts but not on third. We have found that the deep cleaning and disinfecting

schedules for the buildings and vehicles are lessening in frequency as the pandemic stretches on.

Gordon Bethune was the CEO of Continental Airlines back in 1980's. He did many things to turn that company around. The one that stuck with me from a safety point of view was when he issued every mechanic two pairs of safety glasses with a simple message, "I bought you these glasses and I expect you to use them. I also want you to take a pair of them home and to use there. You're no good to me blind and it doesn't make a difference if it happens at work or at your home."

The same logic can be applied to this pandemic. It won't matter at all if you wear a mask at work if you don't follow the protocols on your off hours. It's simple. Wear a mask. Wash your hands. Practice physical distancing.

Author's Note:

Before writing this article I honestly used to believe that the A&P mechanic was truly a cut above the rest. After researching for this, I found that we are just a cross-cut of society overall - we have our share of foolish just like everyone else.

TAKEAWAY MESSAGE

UNLESS WE HAVE NATIONAL PROTOCOLS IN PLACE OR STRICTLY ADHERE TO COMPANY POLICIES, WE WILL CONTINUE TO GET SICK AND MANY MORE OF US WILL NEEDLESSLY DIE.

Mr. John Hall has been working at the airline for 41 years now. He began working on helicopters for the USMC at age 17. Upon discharge, he got his A&P license and went to work at an aircraft repair facility in Van Nuys, CA. He then got hired at PSA (the original one) in 1979. Four mergers later, he is now hopefully at his last airline. He has been a Lead Mechanic since 1982, and is currently the Director of Flight Safety for the International Association of Machinists. He is also a member of the Maintenance ASAP Event Review Committee.



Don't Let a Lack of Resources Become a Lack of Resourcefulness!

Doug Neufeldt

Editor's note: Doug is one of the many individuals whose job role at an airline was eliminated as a result of COVID-19. Before September 2020, and for the previous 5+ years, Doug was the SMS Manager for Technical Operations at United Airlines Chicago. One of his notable contributions to the company was his development of a monthly human factors newsletter, providing resources and reminders to technicians about the important role of human factors in aviation safety. He also collaborated on human factors research activities with the FAA and is a respected colleague to this Quarterly newsletter's editorial team. Our very best wishes go with Doug as he uses his resourcefulness to navigate the next steps of his career.

This year has been one of extraordinary circumstances. We have witnessed things never seen on a global scale. Many industries have been hard hit by the global pandemic and one of the hardest hit is the aviation sector. The COVID-19 pandemic has really showcased what a lack of resources, or even a perceived lack of resources can manifest into. While there were huge shortages of things like personal protective equipment (PPE), medical equipment, sanitizer, and cleaning supplies due to medical and community needs, there was also a perceived lack of other resources and people started hoarding things like, toilet paper, cleaning supplies, and bottled water. This did not just happen locally, but across the globe.

"EACH MISSING OR SHRINKING RESOURCE LED TO OTHER RESOURCE REDUCTIONS OR RESOURCE REQUIREMENTS."

The current situation of the airline industry is dire. The global pandemic that created the lack of resources noted above also created a lack of resources for the airline industry – a lack of passengers, which created a lack of revenue, which created a reduction in required personnel (lack of work). Each missing or shrinking resource led to other resource reductions or resource requirements. While there is not much we can do about these external influences, let us look at what we can do as

Aircraft Maintenance Technicians (AMT) when we are faced with a lack of resources in our day-to-day work

To accomplish our role as an AMT, we really need only four resources.

1. **Manpower (enough qualified people to do the job)**
2. **Materials (parts, documentation, raw materials)**
3. **Tooling**
4. **Time**



If we have all four of these, we can accomplish any maintenance task. But what happens when one or more of these resources are missing? FAA certificated AMTs are some of the most resourceful

people I have ever met. We routinely are faced with a lack of one, or more, of those four resources, yet we help to ensure a safe, reliable product every day. That is not just good luck. It is due, in large part, to the resourcefulness of AMTs. For example, in situations where we don't have the right tooling for a job, I have seen AMTs make a tool to accomplish their task or borrow a tool from another operator nearby. The same can be said for materials. When we don't have a part we need to repair the aircraft, we can look at options like potentially robbing (borrowing) a part from an aircraft in maintenance, or use resources like Advisory Circular 43.13 to make repairs to many things. If you work at a Part 121 or 135 operation, you may produce articles for installation on the carrier's own aircraft without a Parts Manufacturer Approval, provided the installation of these articles is approved in accordance with Part 43 and complies with the air carrier's accepted maintenance procedures manual and instructions.

One of the resources that affects us the most as an AMT is time, generally a lack of it! This one can be a little trickier depending on the size of the operation and the location of the work being performed. Even in a medium sized operation, there are often options of swapping aircraft routings to gain some extra time. You can also be proactive with your planning team, if you have one, to ensure adequate time is being allotted for the anticipated workload.

As the title of this article suggests, as AMTs we should not let a lack of resources turn into a lack of resourcefulness on our part! Part of the fun (and the challenge) of this line of work is being able to "think outside the box" and come up with safe solutions to problems we didn't even know we had until that day. It has always been one of the best parts of the job, knowing that an aircraft departed on schedule due to the quick thinking of the AMT. Be safe, and continue that great history of conquering those perceived lack of resources, even during trying times such as COVID-19.

Doug is a very experienced Part 121 Technical Operations specialist with more than 25 years in aviation. In addition to serving as a KC135-R Crew Chief in the U.S. Air Force he has worked as a Line and Base Technician, and held Management roles in Maintenance Planning, Quality Assurance, and Maintenance Safety at United Airlines, which included leading Maintenance Human Factors for 9000+ Technicians. When not writing about himself in the third person, he can be found pursuing one of his, far too many, hobbies.



One Engineer's Observation of OEM Efforts amid COVID-19

Dr. Maggie Ma

"BOEING CONFIDENT TRAVEL INITIATIVE ENHANCES HEALTH SAFEGUARDS FOR AVIATION WORKERS AND THE TRAVELING PUBLIC THROUGH WORKING ACROSS THE INDUSTRY"

As much of the world, I have been telecommuting from home since mid-March. Normally I would have traveled around the world two to three times within any five calendar months. Now I have messages from Google Maps Timeline highlighting my trips to neighborhood parks. Work days seem to be stretched longer from 5:00 am safety meetings with Europe to 7:30 pm training session with customers in Asia. But that is a small sacrifice to make to have the privilege to contribute to aviation safety, and to support customers during this challenging time. Being "grounded" by the pandemic has forced me to slow down, reflect, and learn to appreciate my new office mates (aka, family, see Photo 1). After supporting my son's 4th grade virtual learning for three months, I promise myself to hug (when social distancing changes) every single elementary school teacher I ever come across. I have also deepened appreciation for my company – Boeing has been working harder than ever to support its customers, employees, and the traveling public. The following are some efforts I am familiar with as a Customer Support Engineer at Boeing Commercial Airplanes.

Massive Storage and De-Storage Effort

COVID-19 pandemic has led to thousands of airplanes being placed in storage around the world. Permanent retirement of older aircraft models such as Boeing 747/757/767 and Airbus 380 have been accelerated in 2020. Traditionally, when operators temporarily remove their aircraft from service, they must store them in an environment that is conducive for preservation. Due to the sudden nature of the pandemic, many aircraft are being stored at active airports in less-than-ideal environments.



Photo 1. My Office Mates (Pessimists view: a poor daddy with bad ergonomics; Optimists view: getting work done and the baby is happy.)

Stored/parked aircraft requires a tremendous amount of maintenance work to ensure overall airplane airworthiness and to prevent technical failures from occurring upon Return-to-Service (RTS). The European Union Aviation Safety Agency (EASA) and industry representatives compiled a COVID-19 safety risk portfolio (EASA¹, 2020). The portfolio identified "The rapid storage and de-storage of aircraft may lead to technical failures" as one of 48 safety issues affecting commercial aviation during and after RTS. Original Equipment Manufacturers (OEMs) like Boeing directly affect the identification and mitigation of certain hazards. For example, OEM procedures were not originally designed for mass

parking and storage scenarios. OEMs work closely with the regulators to help the operators manage the impact of deferred maintenance tasks.

Boeing publishes two types of documents for storage based on each operators' specific situation: Active Storage and Prolonged Parking. Active Storage is to maintain the airplane in a ready scenario where an airplane can RTS quickly, but requires a higher level of maintenance while in storage. Prolonged Parking requires less manpower during the storage period but requires more maintenance to ready the aircraft for RTS. In addition to providing procedures for storage and parking, Boeing has established a large forum – Boeing Maintenance and Storage Team – centered on lessons learned from different aircraft models and seeking advisement from different engineering teams, technical experts, and suppliers. The forum has daily meetings that address individual operator requests for special situations that require deviations. If there is an improvement that one model is incorporating into the respective Boeing Aircraft Maintenance Manual (AMM), all Boeing models will be assessed to maintain consistency in storage and parking procedures since most operators have multiple airplanes types in their fleet. Maintenance task interval extension is a big topic as many tasks intervals expire during storage. In InFO20005 (FAA, 2020), the Federal Aviation Administration (FAA) notifies operators of temporary changes to FAA policy on the use of Short-Term Escalations (STE) to manage scheduled maintenance requirements affected by the COVID-19 public health emergency. Boeing has also released guidance to their operator base in the form of Service Letters (SLs), providing 6-month relief for all models. Specific operator interval extension inquiries are handled on a case by case basis. In addition to communicating via Multi-Operator Message (MOM) and organizing Working Together Team (WTT) meetings with operators, Boeing is working closely with the regulators for further guidance on maintenance task interval extensions.

EASA has published the guidelines for stored aircraft with the support of industry and national competent authorities on July 20, 2020 (EASA², 2020). Boeing mitigates all identified concerns and operator

feedback based on active AMM updates to reflect most current storage and RTS procedures. Boeing Maintenance and Storage Team is looking at producing “maintenance maps” of known problems related to storage and RTS to assist operators to proactively mitigate potential issues observed in the fleet.

Boeing has taken some proactive actions to support operators in storage and parking. For example, cabin mold testing and abatement procedures were added to the AMM prior to receiving operator requests. Several additional actions have been taken to mitigate/eliminate adverse effects of less-than-ideal storage environment such as Corrosion Inhibiting Compound (CIC) application for areas with known challenges to environmental impact, recommendation of the wash cycle program, and improved storage inspection program based on fleet wide experience.

The COVID-19 pandemic has literally halted the world. The latest estimates indicated that the possible COVID-19 impact on world scheduled passenger traffic compared to baseline (business as usual) would be approximately USD 343 to 383 billion potential loss for the 2020 full year (ICAO, 2020), with about 25 million jobs at risk (IATA, 2020). Engineers and technical professionals across airplane OEMs are facing Human Factors challenges (e.g., manpower, reduction in knowledge and experience, time pressure) when trying to act quickly responding to an unprecedented situation with little time to reflect on actions. It is not an easy balancing act to provide more comprehensive procedures for storage and de-storage while attempting to avoid overburdening operators. OEMs recognize that operators might be struggling with a means to comply with all the new requirements due to layoffs and furloughs. Human Factors personnel are not immune to layoffs, which unfortunately has created a hazard with negative impact on safety and efficiency in the long run. Boeing and other OEMs will continue to work closely with and wait for guidance from civil aviation authorities as the industry navigates the unprecedented situation.

Protecting Employees at the Operators and Boeing

To protect maintenance technicians who work on Boeing aircraft, some maintenance procedures were enhanced to ensure the safety and health of technicians from airborne contaminants while performing the tasks. For example, AMM procedure for removing and installing Recirculation Air Filter across Boeing models now requires hooded disposable coveralls, non-vented safety goggles, and N95/99/100 respirator. Once removed, the old filter needs to be immediately placed in a plastic bag and tape sealed. The technicians will disinfect the plenum before installing the new filter. All tools used for filter replacement must be disinfected. Upon completion of the task, Personal Protective Equipment (PPE) needs to be tape sealed in a bag. The bags with old filter and PPE need to be discarded per airline, local health, safety and regulatory procedures.

To protect Boeing team members, there is an internal Boeing Coronavirus Information site which provides detailed workplace return guide emphasizing each individual's role in keeping the workplace safe. For returning to work, guidance is provided for face covering, temperature check, enhanced cleaning process for workspace, and so on. Telecommuting team members are provided with safety and health tips for working remotely, resources for technical issues, and transitioning tips from telecommuting. There is transparent and up-to-date information regarding confirmed positive COVID-19 cases among the workforce. Travel advisory is provided for business and personal travel including latest restrictions. For US based employees, a new medical service called 98point6 was introduced to provide secure, text-based primary care on smartphone 24/7 at no cost anywhere in the US. In June, I had some skin irritation which grew worse over a couple of days. I downloaded the 98point6 App and set up an account. Within 10 minutes I was seen by a primary care doctor from the comfort of my house. The appointment itself took about 10 minutes. Within 20 minutes, my pharmacy texted to inform me that my

prescription was ready for pickup. Telemedicine delivered care safely – I didn't have to physically travel to a doctor's office worrying about increased exposure to COVID-19.



Photo 2. Boeing Employee Care Kit

Boeing is providing Employees Care Kits (two face coverings and a personal digital thermometer) to all employees (see Photo 2). At Boeing facilities, all workers are required to wear face coverings. However, it turned out to pose a big challenge for hearing impaired employees because seeing someone's face is essential for them to understand co-workers and conduct business. Facial expressions are extremely important for communication, and hearing impaired employees can rely on hearing aids and lip reading to communicate with others. Facial expressions are equally necessary for those who communicate using American Sign Language (ASL), as a word could mean something completely different without specific facial expressions. After some employees spoke up about the issue, Boeing leadership took a One Boeing approach to provide safety compliant, clear face coverings that allow for lip reading (see Photo 3).



Photo 3. Janice Clark (center), an executive administrative assistance relies on lip reading to communicate. She and her team wear clear face coverings.

Confident Travel Initiative

Boeing launched the Confident Travel Initiative (<https://www.boeing.com/confident-travel/>) to enhance health safeguards for aviation workers and the traveling public through working across the industry. A multi-layered approach helps to keep passengers and crew safe and healthy. The first step in safe air travel amid the COVID-19 pandemic is to prevent the virus from boarding the airplane. Crew and passengers play a vital part – avoiding travel when feeling unwell and practicing safe-guards and self-care. The second step is to follow guidance from international health agencies, Boeing and airlines created comprehensive approaches to cleaning and disinfecting the airplane cabin and flight deck. The third step in the multi-layered approach is to maintain a healthy cabin environment. Boeing airplane's proven air circulation systems filter out more than 99.9% of viruses and bacteria, exchange the air every two to three minutes, and create air flow that limits the spread of airborne contaminants. Boeing and partners have been working hard on some exciting new technologies to further enhance health safeguards. For example, shielding surfaces with anti-microbial coatings, which make it hard for microbes such as viruses to grow. Ultraviolet (UV) can be an effective disinfection method. Boeing has developed a self-disinfecting lavatory prototype that uses UV light to disinfect all surfaces in about three

seconds after each use. In addition, Boeing is evaluating a hand-operated UV wand as a potential addition to the current cabin cleaning tools. Another key feature of the Confident Travel Initiative is active two-way communication. The website surveys how the public thinks and feels about traveling addressed some frequently asked questions, shares guidance from different regulators and trade organizations, and shares a Boeing executive's personal travel story in the COVID era.

On January 1, 2020, I re-posted a beautiful e-post card of fireworks for family and friends wishing them "May your year ahead be full of peace, love, magic and joy." I could not have imagined in a million years what an eventful year 2020 would turn out to be. Like the saying goes, we may not always have control over a situation, but we can control how we respond to it. I feel blessed to find joy in my work, love from my family/friends and work family. Aviation is magical and addictive, so is travel. The world is eagerly hoping and waiting for the magic of aviation to reunite us.

TAKEAWAY MESSAGE

WE MAY NOT ALWAYS HAVE CONTROL OVER A SITUATION BUT WE CAN CONTROL HOW WE RESPOND TO IT.

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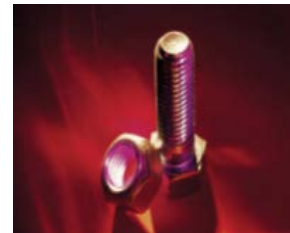
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