
PILOTS
IN COMMAND
YOUR BEST TRIP, EVERY TRIP
SECOND EDITION
KRISTOFER PIERSON

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Pilots in Command: Your Best Trip, Every Trip
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by Kristofer Pierson

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FOREWORD

When aviation students head to college, they learn all about airplanes, weather, ATC, CRM, and how to fly in the big skies that surround our world. For many students, they stick to the hard work, progress through their certificates and ratings, and when they graduate, we are rightfully proud of their accomplishments. After college graduation, students launch into their careers as professional pilots. Many take the conventional route of instructor, regional airline pilot, and the giant step to the majors. This is the same route that Kris Pierson took. As one of his professors, I could wisely wag my graying head and boast that we gave Kris his wings as a professional pilot.

Then I read *Pilots in Command: Your Best Trip, Every Trip*! Reflecting the tirades of Grampa Pettibone, an old friend from naval aviation, I bellowed, "*Jumpin' Jehosaphat! Where did he learn all that dad-burned stuff?*" I scrutinized the table of contents from our college textbooks, those cardinal guides we use to funnel piloting knowledge and skills into our fledgling aviators. There were no chapters on "Lifeguards of the Skies" or "Not Your Airplane, Still Your Baby." Our texts had many pages devoted to the concept that 65%…or 75%…or even 85% (pick a number in the upper range) of airplane accidents were caused by human error, but there wasn't a chapter on "When Personalities Fail, You Can't." In our college education courses, flight attendants weren't mentioned as members of joint CRM training classes. Funny thing—in a 490-page college textbook for Commercial and Instrument Pilots, "customers" got less than a quarter of a page.

In *Pilots in Command*, customers get a whole chapter; so do dispatchers! Imagine, a whole chapter on "Away From the Airport But Still at Work." In college we seldom taught pilots what to do when they were off-duty; we never mentioned "Crew Interactions on Layovers." As new pilots emerge from their chrysalis, they are ready to explore the complex (and sometimes messy) world of professional flying. This book doesn't cover everything an airline pilot should know before taking that first step across the threshold of an airline company, but it helps to fill the huge gap between the College Textbook and the Flight Operations

Manual. Indeed, the book should be mandatory reading before a pilot accepts an invitation for an airline interview.

If you read *Pilots in Command* from cover to cover, you will be compelled to check the table of contents again. There isn't a single chapter about flying an airplane! Isn't that what airline pilots do? Sure it is, and we taught Kris how to fly in college. *Pilots in Command* is the post-graduate course or at least a senior seminar. It's about all the "other things" that professional pilots *must* do.

By the way, I used the word "professional" four times already; that's really what *Pilots in Command* is all about—pilot professionalism. The professional pilot is like the professional football player—always in the spotlight, always the center of attention. With this book, pilots can do the same, but more "gracefully."

Dr. Guy M. Smith
Associate Professor of Graduate Studies
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ACKNOWLEDGMENTS

When I set out to make a career as an airline pilot, I never imagined I would write a book about how to be a *better* airline pilot. There are many people who are responsible for inspiring, mentoring, and pushing me to succeed in ways I never dreamed.

Thanks to the loving support of my wife and best friend, Sarah, this project has taken the shape it has. I also thank my children, Evelyn and Oliver, who cheered me on. It is because of my parents, Dave and Julie, that I have my wings. The advice and mentorship of my dear friend Dave Burkum motivated me to take a series of blog posts and make it into this book.

This book is dedicated to friends and colleagues who challenged me to be my best at my job. Dr. Earl C. Benson, my high school band director, took me for my first flight in a small airplane. Above the band room chalkboard in giant yellow letters were the words, "RESULTS NOT ALIBIS!" My profound respect for SOP and standards has been in imitation of Capt. Paul Kolisch, who continues to make the industry a safer place by pushing for the best in training and standards across the industry. My writing skills, diligence, and vision have been inspired by Ms. Jane Schraft. She has spent her career helping pilots fight for safety and professionalism from within their ranks, and to work with the airline managers who are just trying to keep things on time. There are countless captains and first officers I have flown with who never settled for anything less than the best on every trip, and they all have my gratitude.

I give special thanks to Dr. Guy Smith for contributing the foreword to this book, and for inspiring myself and many other pilots to love, live, and breathe CRM. Thanks also to Dr. Mark McCloskey, Kristine Tichich, Jackie Spanitz and ASA, and to my airline employers, past and present.

Finally, this book is in honor of my father, Dave Pierson, who always was so excited about my flying. He was, and is—even in his passing—my primary mentor, hero, professional role model, and patron saint, inspiring me to make every trip my best trip.

ABOUT THE AUTHOR

Kristofer Pierson is a pilot for a major U.S. airline based in New York. He holds an ATP with type ratings on the Boeing 757/767, Bombardier CRJ900/700/200 Series, and Saab SF340. A former instructor and evaluator at the general aviation, collegiate, and airline level, Mr. Pierson has several thousand hours of flight experience as both a Captain and a First Officer. He has a B.S. degree in Airway Science—Aircraft Systems Management from Rocky Mountain College in Billings, Montana. For more information and resources from Mr. Pierson, visit www.krispierson.com.

Photo by Laura B. Ketcher

INTRODUCTION

Thanks for picking up this book. I want to tell you a little about why I wrote it, and how it came to be. I also want you to understand my perspective in writing the book, as it sets the stage for the content you will find in it.

First, some background: I have maintained a personal blog for more than a decade—since before Facebook, Twitter, and others changed the shape of the World Wide Web into the vast and global Internet we now know. Though the frequency of my blog posts has been sporadic, I have always enjoyed having that outlet for writing and that connection with people who took the time to read what I had to say. My writings meandered between several personal interests—family, fishing, food, religion, politics, and of course, flying.

Early on in my blogging exploits, and only about four years into my airline career, I wrote a blog post about a tire blowout I experienced on landing. It occurred on a midwinter flight in the Dakotas on the Saab SF340, a 34-passenger turboprop and the workhorse of several regional airlines in the early 2000s. I was first officer on the flight, which all things considered was rather uneventful. We were used to the winter weather challenges posed to crews flying in the upper Midwest on turboprop airliners, hopping between small outstate airports and large city hubs. Snow and ice were a constant battle, especially when the cruise altitude rarely got above 17,000 MSL.

That early morning we preflighted a cold-soaked plane that had been sitting out on the ramp overnight. An area of freezing rain had moved through, glazing the landscape with a thin layer of ice. The Saab had already been sprayed down with Type I deicing fluid—a heated mixture of glycol and water that removed any accumulations of ice, snow, and frost from the plane, and which was viscous enough to remain on the wing to help protect it from further accretions of frozen contaminants. The station agents did a thorough job, as during my preflight I was practically wading through the pink slime as I walked around the plane. There wasn't a trace of ice left anywhere on the aircraft.

The skies were overcast, but no precipitation was falling at departure time. However, the band of freezing rain (FZRA) had set up just off to the north of the airport, and we encountered it during the climb out. Our flight was quick, as we were heading only about 20 minutes north to our next stop to pick up the remainder of our passenger and cargo manifest before heading back to the hub. We picked up a bit of ice along the way, but the Saab's deicing boots handled it just fine. The Automated Surface Observing System (ASOS) indicated arrival weather of low overcast skies, light winds, five miles in mist, and a temperature of around freezing, We set up for the ILS to the main runway and headed in.

The approach was completely normal. We ran the deicing boots all the way in with one last cycle just inside the final approach fix, and we had plenty of mixed ice piling up on the windshield wipers. I think we gave a PIREP to Minneapolis Center of "moderate mixed" icing on climb and descent. The captain was flying this leg, and I was pilot monitoring. We broke out of the overcast layer about 500 feet AGL, and the captain made a sweet, light-as-a-feather touch on landing. It was a true greaser (which really isn't hard in the mighty Saab with a snow and ice-packed runway).

DING! The master caution sounded just as I was complementing his touchdown and calling out "80 knots my tops," taking control of the yoke as the captain transitioned to the nosewheel tiller. "Antiskid," I reported and canceled the master caution. Antiskid cautions were pretty normal occurrences on the SF340 during crosswind landings, with one main gear touching and spinning up before the main on the other side. The indication typically extinguished a few seconds later when the antiskid computer detected wheel speeds that made the logic report, "OK, this is normal."

But this time it didn't extinguish.

The captain had already taken notice and said, "Well, the brakes seem to work OK." He was decelerating smoothly down the runway. The passengers were probably still sleeping! We made the turnoff, cleared the runway, and I called Center to report our arrival and cancel IFR. After getting off the radio, while I was doing my after landing flow and checklist, the captain became concerned.

"Something doesn't feel right in the tiller. It's like it wants to pull a bit to the left."

"Even when you are off the brakes?" I queried. (Sometimes pilots would ride the brakes to control taxi speed; in some planes that are light, this is needed due to the excess thrust at idle.)

"I'm not even on them, and I'm in beta on both engines, and she pulls. Then even when I bump up the power she pulls, even asymmetric power," the captain explained.

"Well, maybe the antiskid failed and a brake is dragging or something," I offered. After all, the antiskid caution light was still on, and we hadn't really addressed it yet.

"Nah—if the antiskid failed, its fail-safe is to release the brakes, not engage them, right?" he asked. I really didn't remember exactly. It sounded right, but what if it was some other brake failure? True enough, part of the antiskid system was "touchdown protection," which ensured the brakes were not locked up on touchdown but then allowed the brakes to engage when a certain wheel speed was sensed. Spin-up of an airplane's wheels to that speed takes less than a second. After that, the system works to prevent lockups and resultant skids between the four main gear wheels on the SF340.

We were continuing down the taxiway to the terminal. Despite the captain's complaints, I really didn't feel any dragging or difference in the smoothness of the taxi compared to normal.

"Well, do you want to run the QRH or anything?" I asked.

"It seems like it's getting better, and the brakes are working fine," he said as he gave a couple demonstrative pumps to the binders. "Let's get parked, and we will run the QRH before we shut down. We've got time."

We did have the time. The flight was overblocked (scheduled with a longer-than-average flight time) and we often sat at the gate with at least one engine running with the prop in feather just to keep the passengers warm while we killed the time. As it was, we would have about 45 minutes before we would need to head back out, and we were only boarding five more passengers. The QRH (Quick Reference Handbook) checklist for "ANTISKID" would hopefully resolve our issue, if one existed.

As we pulled into the ramp area we spotted one of our regular station agents headed out to the parking line with wands and chocks in hand. As we approached, he started to marshal us in. Then, very oddly, he got this look on his face as if he was seeing something unexpected and strange.

His signaling motion slowed and he was staring at our left main gear. He guided us in to park, gave us the signal to stop, placed the chocks in around the nose gear, gave the chocks-in signal, and then very excitedly started pointing to the left main gear.

"What the?! I'm shutting down the left side for now," said the captain as he feathered the props and shut down the number one engine. As the left side spun down, he popped open the flight deck door and asked the flight attendant to open up the main cabin door.

As soon as the main cabin door was opened and airstairs lowered, the agent bounded up them and stuck his head into the flight deck.

"Guys, you have got to see this! You have a totally flat tire!!"

I guarded the brakes as the Captain went outside to see for himself. When he got back, I knew exactly what he was going to say even before he said it.

"We aren't going anywhere for a while."

We shut down the right engine, briefed and deplaned the passengers, and headed inside to call maintenance. Sure enough, the left main outboard tire was completely flat. Surprisingly, the inboard tire was intact, but under some stress from having to carry a bit more of the load. The captain was right: we were stuck for a while.

The mechanic arrived with a new tire (three hours later) and changed it out. He called us out from the station office to take a look at what he found. The tire had a hole in it about 3 inches in diameter—a literal hole, not a crack or a slice, but an area where there simply was no more tire. It was a gaping hole from where the tire had been dragged all the way in from touchdown to the gate.

The wheel assembly itself had been locked frozen with ice. The same ice we PIREPed on the way in: moderate mixed ice. Typically, main gear can handle the ice because the impact of landing and wheel spinup breaks any ice accretion. This was not the case for our left main outboard wheel. It had never spun up, and we had been oblivious. We thought the antiskid had failed. Well, it had, but not on its own accord!

To make a long story short, we were on our way to Minneapolis after a four-hour delay. It truly could have been longer, but we worked hard to prevent that from happening. How? We simply took actions that kept the lines of communication open between our resources. The captain focused on coordination with dispatch and maintenance, and he delegated

the task of keeping the local station, passengers, and crew scheduling in the loop. When the mechanic arrived, this meant I was also assisting him since he was the only one sent by the company. I ensured he had what he needed to do his job, including borrowing a forced air heater from the local FBO to get the wheel assembly thawed out.

It was a good example of threat and error management, crew resource management, and overall pilot leadership skills being applied in a rather everyday type of outstation breakdown. It was what we were used to, and how we operated at that carrier.

I posted this story, or something very close to it, on my blog. I was extremely proud of our actions as a crew, and I thought it was a remarkable story, with the iced-up gear and all. I received great responses from people about it for the few days it was online. Then I was called into my chief pilot's office. The company's CEO evidently had read my post and asked that it be taken down.

Back then, social media policy hadn't yet been invented (and, as I said, neither had Facebook or other social media sites). It was an ultimatum against which I didn't have a good argument, since my chief cited that (1) the employee handbook clearly stated that all public and media relations about flight events have to be approved by corporate communications, and (2) the request was coming straight from the top.

Alas, my blogging about flying days seemed numbered. But I always wanted to relate more than just cool stories like "There I was…cheating death again." I wanted to write about crews, captains, and people. I wanted to share experiences with passengers, ramp workers, and gate agents. And I especially wanted to write about the schoolhouse, and relate the good, the bad, and the ugly of airline pilot training. My tact would not be one of an exposé writer, pulling back the curtain to see behind the scenes. Rather, I wanted to share experiences that would help other pilots become better at their jobs. I wanted to take the valuable, non-dramatic, factual, and results-not-alibis type of conversations from the flight levels and the crew rooms and bring them forward.

So a couple of years ago on a long layover, I started drafting a blog post. It was going to be about pilot roles and the responsibility and authority of the pilot-in-command (PIC). Captain's authority is a subject that has a long legacy of debate—between pilots and management, between management and the FAA, and among scholars and laymen. But

the rubber meets the road every day, on every flight, as PICs make decision after decision to ensure the safe operation of their flights. It came to my mind that captain's authority is not just something that can be defined and interpreted from the Federal Aviation Regulations (FARs) and company operating procedures. Instead, it is a vested capacity of pilots to work with their crews and resources to enable the flight operation to take place.

The blog post got longer and longer as I drafted it. I started thinking about doing a series of posts. As I worked through my ideas, however, it dawned on me that I didn't have a collection of blog posts so much as I had a book.

And, so, *Pilots in Command* was born.

Having been a regional airline pilot for 13 years before moving on to the majors, much of my reflections in this book come from the angle of a captain who was constantly flying with pilots who were new to the airline industry. That's what I did, and that is what regional airline captains are doing today as we move into another large cycle of hiring at the majors and regionals.

Now that the FARs require much higher standards for experience and education for new-hire airline pilots than ever before, I wrote this book intending for it to become a guide for new or aspiring airline pilots, as much as for the experienced pilot who is looking ahead to upgrade. In order to work for a U.S. carrier under 14 CFR Part 121, a pilot must possess an Airline Transport Pilot (ATP) certificate. Prior to 2013, only a Commercial Pilot certification was required.

The upshot of these new requirements is this: Every airline *hires pilots* with the intention that they will someday in the near future upgrade to a captain position. The FAA *certifies pilots* with the intention that they are ultimately responsible—and qualified—for every operation they will undertake under the privileges afforded them by their ATP certificate. The FARs are explicit on this last part. All pilots operating under 14 CFR Part 121 must "...be fully qualified to act as pilot-in-command..."

But initial pilot training (i.e., "new hire" training) will not include a "Captains Class" module. At least, it doesn't yet. And while training programs will be evolving quickly to adapt to new requirements, a bit of a gap exists between the classroom and real-world flight line operations. A pilot new to the industry, or even a pilot with several years as a

first officer, may not get everything he or she needs from the classroom. Traditionally, this has been one of the roles of initial operating experience (IOE) training. Experienced check airmen are charged the responsibility to acclimate pilots to the real-world operating environment that a captain works in.

The classroom has expanded a bit now. Under the regulations, newly minted airline pilots going forward will be trained under 14 CFR §61.156, which outlines the curriculum requirements for ATP applicants. Finally, after years of expecting captains to simply evolve from the right seat to the left seat, the FARs recognize the need to bridge the training gap for captains. Specifically, ATP training curriculum must include at least six hours of instruction on leadership, professional development, crew resource management, and safety culture.

It is my intent in *Pilots in Command* to help bridge that gap. I wrote this book with every pilot in mind: the college student working his way through an FAA-approved curriculum to be an airline pilot; a new hire at the regional/express carrier; a new hire at a major/national carrier; a captain upgrade candidate; and pilots who want some extra insight, tips, and tricks of the trade. I also wrote this from the viewpoint I think all pilots share: we all want to be better. We all seek improvement and we want to keep the blade sharp. As I worked through each topic covered in the book, I developed an approach of "best practices" for pilots. From briefings to handling non-normals, and from reviewing a dispatch release to getting a good night's sleep, I have written this book with a practical approach, filled with simple steps to take, mnemonics to remember, and checklists to complete in your everyday efforts to be the safest, most responsible leader you can be both in and out of the flight deck.

Thanks for reading. Fly safe!

1

DEFINING A PILOT-IN-COMMAND

In every modern transport-category aircraft cockpit, two or more individuals are employed in the task of flying the airplane. Nine out of ten of these cockpit crews are flying passenger-carrying equipment which requires additional professionals on board the aircraft to oversee the passenger cabin. A very small percentage of the crews who ferry passengers about do not have flight attendants—most likely due to aircraft size—and are responsible for the passengers themselves. Some other crews at the aircraft controls are the only souls on board their aircraft, for a myriad of reasons.

However, all of these cockpit crews share one very important characteristic: There is one—*and only one*—member of the crew who holds all responsibility for the flight alone: the pilot in command. The Federal Aviation Regulations (FARs) are explicit in their charge to this person.[1] 14 CFR §91.3 states:

> **Responsibility and authority of the pilot in command.**
>
> (a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.
>
> (b) In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.
>
> (c) Each pilot in command who deviates from a rule under paragraph (b) of this section shall, upon the request of the Administrator, send a written report of that deviation to the Administrator.

Three simple sentences exist in this concise regulation. Sentence (a) tells us what the pilot-in-command is responsible for. It is a one-line description of his or her ultimate role when flying an airplane. Sentence (b) describes the latitude the pilot-in-command has to "break the rules"—and it is a very small amount of latitude. Finally, sentence (c) places the

requirement of reporting to the FAA, upon request, how much latitude a pilot-in-command exercised in accordance with sentence (b) in the case of an emergency.

When student pilots conduct their first solo flight, they are the sole operator of the aircraft. Nobody else is there to help. The only carriage is the pilot and their personal items, no other passengers or cargo. It is hard to find a professional pilot today that doesn't vividly recall their first solo flight, the primary right-of-passage for every pilot. How hard was that first solo? Preflight, taxi, takeoff, two touch-and-go landings and a full stop, park and shut down, postflight the airplane, and then it's time for pictures and celebration. For many of us it was a hard, stressful experience, as well as one of the biggest accomplishments of our lives, and really our flying careers.

This one moment in time for each and every pilot establishes them as a pilot-in-command—"PIC". As a matter of fact, it is the first logged time that goes in the "PIC" column of the logbook. Furthermore, it is the very first time 14 CFR §91.3 applies directly to the pilot. What makes a pilot a PIC during first solo is the fact that they are all alone. They are indeed *"directly responsible for, and the final authority as to, the operation of that aircraft."* No flight instructor is present to hand controls off to when the flare doesn't look right. And the solo pilot's flight instructor, sitting back at the flight school lounge sipping coffee in a supervisory fashion while their student goes it alone, is not logging any time for that flight either. Only the solo pilot is.

After the first solo, a pilot's experiences as PIC accumulate over time. Those experiences make them better PICs as their behaviors change and they learn more about how to operate and handle abnormal situations. Certificates and ratings are earned as milestones along the way. Then, at somewhere between 500–1,500 hours of logged PIC time, pilots who get hired to fly for a living—on equipment from crop dusters to cargo, and from business jets to Boeing 747s—take on much larger roles in operating an aircraft. They go from flying for themselves to flying for someone else, and with that the responsibilities increase ten-fold. Some pilots, like the crop dusters, will still be flying solo. Others will start flying as a crew. However, they all retain the primary instincts of their first solo flight—the instinct to be the pilot-in-command. As we will see later in this chapter and throughout the book, being a PIC is not merely about having to act on your own. Quite to the contrary, the most effec-

tive PICs rely on their crew, their resources, and the factors surrounding the entire flight environment to fulfill their role under 14 CFR §91.3.

Yet many pilots find 14 CFR §91.3 to be the most complicated FAR to comply directly with, especially those who are responsible for a larger crew or larger aircraft. Roles and responsibilities not only get delegated, they also get shared. The higher workload levels of larger aircraft, while to some extent mitigated by adding more crew to the ship, complicate adherence to §91.3 even more, simply because there is so much more to keep track of. Finally, the very primary tenet of PIC, the title of §91.3 itself—the responsibility and authority of a PIC—is challenged not only by uncontrollable circumstances and conditions, but also by the very regulations, procedures, and practices pilots and operators employ in the name of safety.

This chapter examines these challenges to the PIC, and gives a primary look at how they can be eliminated.

COCKPIT CREW ROLES

Modern airline transport cockpits have been developed, engineered, and automated to the maximum extent possible. A single pilot could more than likely fly a transport category airliner on their own, and in emergency situations, it may be necessary to do so. But that is not the intent of cockpit design. State-of-the-art technology and automation will never replace the function of a crew.

So, let us consider the cockpit crew of a modern airliner. The majority of these crews consist of two pilots: the pilot-in-command (PIC), and the second in command (SIC). More colloquially, these roles are named in company manuals and airline labor agreements as "captain" and "first officer," respectively. Some aircraft require other cockpit crew, perhaps a "second officer" (typically a flight engineer), or maybe an "international relief officer" or "relief pilot" (which is an additional SIC pilot or pilots who relieve the primary flight crew during extended flights for the purposes of rest). No matter what the combination of flight deck crewmembers is—captain and first officer, captain and two first officers, two captains and two first officers, three captains and one first officer—there is always one, *and only one*, pilot designated as pilot-in-command.

A challenge naturally presents itself between PICs and SICs, and it has to do with the "PIC instinct" I mentioned earlier in the chapter. All

pilots are programmed with that instinct, and despite experience, certification, ratings, or any other auxiliary qualifications, many pilots see themselves as equals because we all know what it means to be PIC. The challenge therein lies in the ability for SICs to let go of their authority instinct a bit, and for PICs to fully assert their authority instinct.

Many airline pilots are familiar with the phrase "right-seat captain." It is not a flattering characterization of a pilot. If someone is characterized as a right-seat captain, it means that a personality conflict occurs between the crewmembers and that assertiveness is imbalanced. There is a healthy way to cure the imbalance, and it involves the clear distinction of roles and responsibilities between the PIC and SIC.

Much of this distinction is accomplished by the standard operating procedures outlined in company manuals. Even more is accomplished in specialized crew resource management (CRM) training courses given to airline crews. From both of these sources, we can find common determinations of which roles and responsibilities traditionally belong to each crewmember. Here is an example:

PIC:

- Reviews and approves preflight planning and dispatch release.
- Initiates and oversees the proper reporting of mechanical discrepancies.
- Gives appropriate briefings to other crewmembers.
- Makes appropriate go/no-go decisions using all available resources in the aeronautical decision making (ADM) process.

SIC:

- Reviews and gives input on preflight planning.
- Coordinates with the ground crew, cabin crew, maintenance, etc. to make sure that aircraft servicing needs are met.
- Becomes PIC when the PIC is not present in the flight deck, is on rest break, or is otherwise incapacitated.

Granted, standard operating procedures (SOPs) differ from carrier to carrier. But the PIC has the primary responsibility to ensure that SOP is followed in the conduct of a flight. It follows then that the PIC also must determine the roles and responsibilities of his or her crew. Simply put, a PIC must have the ability to *delegate*.

The "pilot monitoring" (PM) is typically responsible for the following:

- Manipulation of secondary flight controls upon command by PF
- Monitoring flight control and navigation of PF
- Air-to-ground communications

The above lists are based on the age-old order of aeronautical priorities for a pilot in flight: Aviate, Navigate, Communicate. Both the PF and PM follow that priority in carrying out their duties. Here is a typical sequence of actions and duties performed by a crew during an approach to landing, listed as the flight proceeds inbound from the final approach fix:

PF	PM
Initiates final descent to runway	Monitors descent rate
Calls for final flap and gear configuration	Selects and confirms configuration
Navigates vertically and horizontally down the approach course to touchdown	Monitors navigation, calls out deviations
Promptly corrects any deviations	Communicates with ATC

So what is the big deal, anyway? Why do we need these roles, names and ranks all clearly defined? There must be a driving force—a clear, underlying reason for the ranks, the order and division of duties, the authority, and the boundaries of that authority. Why must we have captains and first officers, pilots and co-pilots, pilots flying and pilots monitoring?

Because pilots are human. And, as Alexander Pope said, "To err is human…"

INTRODUCING THREAT AND ERROR MANAGEMENT

Alexander Pope's quote, from *An Essay on Criticism* (1709), in its entirety is, "To err is Humane; to Forgive, Divine." Pope was writing to, and about, critics of his own work (he was a poet) and admonishing them on how to critique fine art. The essence of Pope's comment is that there needs to be recognition of the natural occurrence of error in anything we do as humans. By divine grace, messing up every once in a while is forgivable. The relationship between human error and divine forgiveness is dramatically demonstrated by the act of human flight.

My first flight instructor once made the sage observation, "If God intended man to fly, Adam would have been born with wings." I am sure he had heard this said somewhere else, but as a teenager, it sounded original to me. Professional aviators realize that to have "slipped the surly bonds of Earth" is to have done something we were not intended to do naturally.[4] Thus, a great amount of respect must be given to the science of flight. It is an imperfect science in many respects, but perhaps none more so than in the respect of human factors.

Human factors have been studied extensively since World War II when aircraft manufacturers, psychologists, physiologists, and engineers collaborated to refine aircraft controls and designs to improve safety. Oftentimes, the term "ergonomics" has been linked, almost like a synonym, to human factors. The International Ergonomics Association defines ergonomics as "the scientific discipline concerned with the understanding of interactions among humans and other elements of a system…in order to optimize human well-being and overall system performance."[5] The organization breaks down the discipline into three distinct domains: physical, cognitive, and organizational. In the air transport application, the organizational domain of ergonomic study is home to both *Crew Resource Management* (CRM) and *Threat and Error Management* (TEM).

CRM started when NASA released a study implicating human error as the chief cause of aviation accidents. Early CRM theory and training models focused on the utilization of all available resources to the aviator during operations. The use of knowledge and skills from other crew and team members, the recognition of differences in attitudes, barriers to communications, situational awareness, problem solving, decision making, and teamwork have traditionally been core focuses of CRM. The field expanded extensively in the 1990s, with several airlines running CRM in accord with FAA mandates.

In 1994, the University of Texas and Delta Airlines partnered to begin a new way to evaluate whether CRM concepts were being applied on the actual flight line. The method of evaluation, called *Line Operations Safety Audits* (LOSA), used observations made from the flight deck jump seat on actual flights. While the initial observations focused on evaluating CRM behaviors, error management observations were included soon after. Observers noted when errors occurred, including who made the error, who responded to the error, and the outcome.[6]

CONCLUSION

There is a reason this book is subtitled "*Your Best Trip, Every Trip.*" Anyone who truly loves flying and understands that the act of flight is an amazing technological wonder that man was not designed for has a deep respect for it. As professional pilots, we "cheat death" with every operation. We run complex, sophisticated machines that expend an enormous amount of energy, travel at speeds that approach the sound barrier, and are subjected to mechanical stresses that are tempered and withstood by amazing feats of engineering. And we carry precious cargo: people just living their lives, wanting to get somewhere faster than land-borne travel will allow. People like you and me heading to weddings, funerals, vacations, graduations, business meetings, new lands, new homes, and perhaps new lives.

Being a professional pilot means you cannot forget about your job—your duty, and your debt, to your crew and passengers as mentioned in this book. Your job includes your duty to coworkers and citizens on the ground, your employers, and fellow aviators you share the skies with—all who count on your professionalism.

No matter what your background is, how many hours you have under your belt, or how many type ratings you have, you can start improving today by making a difference in how you operate. If you are a new pilot just entering the industry, this book may set a firm foundation in how you operate in your new career. As a pilot in upgrade training, this book may have given you a new perspective, new methods, or new interest in how to be the best captain you can be. Perhaps you are a seasoned pilot leader, and everything in the preceding pages simply resonates with how you already conduct yourself as a pilot. Whatever the case may be, it is my sincere hope that this book has connected you with information that strengthens your leadership, professionalism, and airmanship.

I encourage you, from the moment you set out for the airport to start a trip, to think about this duty. Think about how you carry yourself as you make your way to the gate. Plan ahead how to brief your crews, how to work with the flight attendants, and how to make CRM work for your

flights. Consider the impact of your resources, from the dispatchers to the mechanics, the ramp personnel to the gate agents. Be prepared for how to handle non-normal situations. Do your best to engage with your customers. Take a responsible approach to rest and fitness for duty, and take pride in professionalism.

This is how you make *every trip your best trip*.

PILOTS IN COMMAND

YOUR BEST TRIP, EVERY TRIP

SECOND EDITION

"Captains Class" is an extra module in pilot upgrade training that air carriers use to train new captains. Considered by captain-candidates as the capstone of training, this enables a pilot to operate each flight, each trip, as a good leader. Yet not every Captains Class provides tricks of the trade or sage advice on leadership, and pilots know that when things go wrong, everyone looks to the captain—the pilot-in-command—to make things right.

Pilots In Command: Your Best Trip, Every Trip goes beyond what is required by flight training curricula, into what is both a rarity and a necessity: solid advice from real pilots to student and professional aviators alike about how to be true leaders. This second edition includes new discussions on professionalism and safety management systems for today's airline operations.

In an easy-to-use format, on a range of topics that all tie into the application of basic leadership skills, the author covers crew roles, crew briefings, flight attendants, crew resource management (CRM), threat and error management (TEM), ground services, dispatch, customer service, abnormal and emergency situations, layovers, crew dynamics, 14 CFR Part 117 rest rules, safety (SMS), and a new model of transformational leadership and professionalism for pilots.

Pilots In Command shares with you the insights and techniques typically gained only from years of experience and interaction with your fellow pilots and crew at 35,000 feet.

KRISTOFER PIERSON, an experienced pilot for a major U.S. airline, has been working in several segments of the aviation industry for the last two decades. *Pilots in Command: Your Best Trip, Every Trip* capitalizes on Captain Pierson's experiences as a pilot, a leader, and an educator.

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