

WHEN PROFIT-SEEKING TRUMPS SAFETY: THE RISKS AND OPPORTUNITIES OF LIMINALITY IN COMMERCIAL AVIATION IN POST-9/11 AMERICA

BY

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Introduction

This chapter contributes to our understanding of the socio-analytic aspects of finance in contemporary society by examining the complicated interrelatedness of money and safety within the US commercial aviation industry. Its thesis is that the airline industry's fixation on financial bottom-lines and increasing profit has diminished safety priorities causing a shift in pilot demographics from a stable, high-skilled, homogenous workgroup to a less experienced, undisciplined, liminal group. This shift has led airlines to rely increasingly on individuals' professionalism and personal discipline to ensure safe flight operations, compensating for containment shortfalls in the system. Yet, a series of accidents provides evidence that aviation industry leaders' lack of attention to this demographic shift and failure to contain the emerging liminal state has contributed to the development of a regressive culture with troubling ramifications for air safety.

Case 1: 1987 Continental Airlines Flight 1713

In 1987, Continental Airlines Flight 1713 was delayed leaving Denver's Stapleton Airport by almost two hours due to snow, fog, freezing temperatures and reduced visibility. Once cleared, the airplane deiced and awaited takeoff clearance for nearly another half hour as snow continued to fall. The take off roll was initially uneventful until the first officer, flying the aircraft, over-rotated on liftoff, stalling the jet which impacted the runway and rolled inverted, killing 28 of the 82 occupants onboard.

Both pilots were inexperienced in their crew positions and unaccustomed to their required duties during cold weather operations: The 43 year old captain had just 166 total hours in the DC-9, of which only 33 were as captain. The 26 year old first officer was hired by Continental Airlines just four months before the accident and had only 36 flight hours in the DC-9. He was assigned the accident flight, only his second as a Continental copilot, because he had not flown in nearly a month and needed to gain proficiency.

Yet unbeknownst to the captain, the first officer had a documented history of poor performance and problems during training. A previous employer's chief pilot described him as "tense and unable to cope with deviations from the routine". At Continental, his DC-9 instructor also voiced concerns—"Completely lost control of the airplane"; "Pitch control jerky"; "Altitude control when pressure is on is somewhat sloppy"; and "Airspeed control generally way out of limits"—all

piloting deficiencies which became a factor during the accident flight (NTSB, 1987: 10-11).

Predictably, the National Transportation Safety Board (NTSB) determined the probable cause of the accident was 'pilot error'. Yet, in their final report, they included an unusual systemic indictment:

The rapid growth of the aviation industry at a time when fewer experienced pilots are in the workforce has reduced the opportunity for a pilot to accumulate experience before progressing to a position of greater responsibility. This loss of 'seasoning' has led to the assignment of pilots who may not be operationally mature to positions previously occupied by highly experienced pilots.

(NTSB, 1987: 38)

Although specific ways to address these deficiencies were not offered, the NTSB suggested "the time has come for the [Federal Aviation Administration] FAA to establish and the industry to accept" operational safeguards to compensate for this 'loss of seasoning'. Yet no such industry response was forthcoming. Why?

To fully understand the interrelatedness of finance and safety in the US aviation industry, we must begin with a brief overview of some of the historical influences impacting commercial airlines in America today.

The Political Economy of US Aviation: Major Trends

Unlike some industries discussed in this anthology, commercial aviation has a relatively brief history. Most any schoolchild can credit the Wright brothers for

the 'invention of flight' in 1903. Yet, it is perhaps more accurate to say that Orville and Wilbur Wright synthesized the best aspects of many peoples' inventions, taking advantage of others' developments to build their *Wright Flyer*. Less than seven years later, the US government marked their interest when Lieutenant Benjamin D. Foulois flew Army Aircraft #1, a Wright biplane at Fort Sam Houston. What is important to note about this historic beginning is how individual innovations coalesced into industry developments, which then attracted public interest and eventually private investors, challenging government entities to catch up after the fact. In effect, a regulatory pattern was already emerging.

World War I did much to advance aviation by providing a research and training ground for new equipment and personnel. Yet, it was not until after the war that commercial aviation really expanded, largely the result of government interventions such as the *Commercial Air Mail Act of 1925* and *Air Commerce Act of 1926*. This legislation funneled taxpayer money into the fledgling industry and established federal aviation regulations that licensed pilots and mechanics, registered airplanes, and developed an airspace infrastructure of airports, airways and navigation aids. Public funds and government interest stabilized civil aviation and attracted private investors creating another trend.

In 1925, the Postmaster General had selected seven air carriers to award ten year airmail contracts, allowing private companies to employ military trained

pilots flying War Department airplanes for financial gain. Most of the major US carriers operating today have roots in this early secret selection and contracting process. Record setting flights by Charles Lindbergh and Amelia Earhart, among others, further enhanced the public's awareness of the advantages of aviation, building confidence in the safety and reliability of flying machines. Yet it was World War II that proved pivotal, pushing aviation to the forefront as a war fighting resource. After the war, commercial advantages crystallized with development of the quieter, more efficient and reliable jet engines. Passengers could now fly farther, faster and safer in commercial jet airliners than ever before.

As aircraft became more reliable and increasingly sophisticated—largely the result of government funding and wartime experimentation and development—consumer confidence grew and commercial airlines profited. As employment opportunities increased pilots unionized, organizing into labor groups such as the *Air Line Pilots Association* (ALPA), the worlds largest, representing nearly 53,000 pilots at thirty eight US and Canadian airlines today (<http://www.alpa.org>).

Airline Deregulation Act of 1978

As commercial airlines began to flourish the US government instituted the *Civil Aeronautics Board* (CAB) to subsidize, regulate, promote and protect the growing industry. Based largely on a railway industry model, the CAB regulated interstate

aviation as if it was a public utility controlling which airline flew where, when and for how much. Yet, the CAB earned a reputation for bureaucratic complacency as industry requests often underwent years of delay and red tape.

For decades, leading economists argued that this sort of government regulation would lead to inefficiency, higher costs and bankruptcy, foreshadowing events to come. Yet it was not until the 1970s when the Middle East oil crisis led to skyrocketing fuel and ticket prices on near empty flights, and the Penn Central railroad collapse required a huge taxpayer bailout, that Congress took action to intervene. In 1978, President Jimmy Carter signed the *US Airline Deregulation Act*.

The purpose of the *Deregulation Act* was to disband the CAB, withdrawing government control over civil aviation and allowed airlines to compete over routes, schedules and fares in a free market. Although a leaner, more competitive aviation industry emerged, the government remained intimately involved. The Federal Aviation Administration (FAA) continued to license and regulate air navigation, safety and airports. The more recently established Department of Homeland Security oversaw passenger security through the Transportation Security Administration while the Department of Transportation protected consumers from unfair and deceptive business practices (US GAO, 2006).

Airline Industry Post-9/11

While many commercial airlines would like the public to believe that the terrorist attacks of September 11th 2001 caused the post-9/11 downturn, informed insiders considered the industry overdue for an adjustment. September 11th simply provided the struggling airline industry with a popularly accepted excuse to downsize, while eliciting sympathy as one of the most visible images of America's struggle against terrorism. Like a clever magic trick, industry leaders distracted the public by blaming the slump on fanatical terrorists, the war in Iraq, epidemics such as SARS, greedy employees, aggressive labor groups and frugal consumers while airline executives, bankruptcy lawyers and economic consultants made millions of dollars.

Take United Airlines for example, an international air carrier which spent nearly three years in bankruptcy protection, a luxury not available to their foreign-based competitors. When this airline emerged from bankruptcy in 2006, executives had agreed to deal 400 managers in for 10 million shares or 8% of the total company, worth an estimated \$115 million on top of their annual salaries. For the top eight executives, that totaled \$3.5 million, plus retention payments of \$1.39 million and target bonuses of at least 55% of their salary, depending upon the executive involved. Meanwhile, CEO Glenn F. Tilton received a base salary of over \$600,000 in addition to \$4.5 million in benefits, over \$15 million in stock options/restricted shares, a \$3 million signing bonus and even \$16,520 in club dues—a total compensation package of \$23.8 million for 2006

alone (Bailey, 2007; Morgenson, 2006: B1). All this occurred while employees were furloughed, wage and benefits were slashed, and consumers were increasingly denied the most basic of flight amenities.

United spokesperson Jean Medina defended this compensation as “appropriate to enable United to attract and retain top performers. It’s in everyone’s interest for management to have this component of management compensation tied to future performance of United’s stock price” (Morgenson 2006: B1). Others are not so convinced. Executive pay expert Brian Foley notes that “the basic concern here is that the players don’t seem to discipline themselves as much as they should”, “external forces aren’t executing any braking power”, and bankruptcy “courts don’t seem to hold people as accountable as they should” (Morgenson 2006: B1).

The post-9/11 bankruptcy filings of Delta Air Lines, Northwest Airlines, United Airlines and US Airways are particularly emblematic of the industry’s reliance on government interventions to stay solvent, even during this so called ‘deregulated’ period. Among the largest bankruptcies in US history, these private companies left government programs and tax payers footing the bill for their managerial inefficiencies with little regard for workers’ interests. For instance, when legacy carriers United and US Airways emerged from bankruptcy \$9.7 billion was shifted to the government backed *Pension Benefit Guarantee Corporation* (PBGC) causing employees to lose a staggering \$5.3 billion of the retirement benefits they earned (US GAO, 2002b). The pension plans of Delta

and Northwest have been similarly underfunded by a combined \$16.3 billion. If these airlines terminate their plans, employees will lose over \$5 billion in earned benefits (US GAO, 2005b).

Another managerial strategy to offset the impact of skyrocketing fuel prices, low-frill competitors' cheaper cost overhead, and post-bankruptcy airlines' leaner workforce was to consider merging. Although not unusual in US aviation industry history—for example Alaska Airlines merged with Horizon Air; American Airlines acquired Eastern, TWA and Reno Air; Continental Airlines paired up with New York Air and People's Express; Delta and United split up Pan Am's routes; Northwest bought Republic; and Southwest acquired Morris Air, just to name a few—so many air carriers considered merging in the post-9/11 period that Congress commissioned a study to review the process. Each merger offers unique advantages, but typically airlines cut costs through downsizing their fleet, furloughing employees and eliminating operational redundancies while increasing revenue by restructuring debt, renegotiating aircraft leases, and expanding networks to serve more city-pair markets, building customer loyalty (US GAO, 2008).

Yet, airline mergers are unsettling for employees who routinely lose money, benefits, control over their schedules—and sometimes even their jobs—with little time to prepare or adjust. And, because pilot seniority establishes the order for promotion, aircraft assignment, work schedules and pay, disputes over the integration of seniority lists can be particularly contentious. US Airways and

America West pilot unions, for example, have yet to agree on the terms of their seniority list integration requiring the companies—which merged over five years ago—to still run largely separate flight operations as labor unions battle it out in court.

Safety

Many airlines' struggles to stay solvent in the post-9/11 period originated with decisions made during the initial phase of deregulation when intense competition and unfettered expansion required the extensive purchase of new airplanes and record hiring of employees at industry leading pay rates. Between 1985 and 1988 alone, nearly 30,000 commercial pilots were hired in the US. To contextualize this information, consider the fact that there are only about 70,000 pilots currently employed in the commercial airline industry in America. In 1989, *Future Aviation Professionals of America* estimated US airlines would hire another 32,000 pilots by the year 2000 and the FAA estimated airline fleets would increase by 25% or nearly 4,200 additional commercial aircraft (*The New York Times*, 1987). This rapid aviation industry expansion exhausted the available labor supply and put younger, less experienced pilots eager to embark on a lucrative career path in the cockpit of nearly every air carrier. As Captain Vern Laursen, Vice President of Flight Training at TWA cautioned, by 1999 "every airline in the country will have 30-year-old captains" (Lavin, 1989).

Contributing to the pilot shortage was the mandatory retirement of large numbers of experienced Vietnam-era pilots at age 60, competitive bonuses paid to keep military pilots in the service and the high cost of civilian flight training. To overcome this pilot paucity, airport flight schools developed accelerated training programs while airlines simultaneously reduced previous standards for age, vision, height/weight and flight experience. This meant that by the late 1980s a pilot with no college diploma or operational experience, a few months of ground training, and as little as 250 flight hours logged via flight instruction, sightseeing tours or banner tows in small single-engine airplanes could be at the controls of a complex commercial flight in challenging environmental conditions. Particularly disconcerting is how these low experience copilots not only represent a safety risk, but placed an inordinate amount of pressure on the captain—who may not have a great deal of experience either—to instruct and mentor, while performing his or her own duties. Yet, it is all perfectly legal by FAA regulations.

The impact of these demographic changes became almost immediately evident. The following section explores several examples:

Case 2: 1992 GP Express Airlines Flight 861

In 1992 a second example of a fatal aviation accident occurred involving unseasoned airline pilots new to their flightdeck roles and over their heads in a challenging situation. GP Express Airlines Flight 861, a Beech C-99, impacted terrain killing three people when the inexperienced crew lost situational awareness while maneuvering in clouds to land in Anniston, Alabama. It was the

29 year old captain's first day as an airline pilot and his 24 year old co-pilot's second month as a first officer. Both pilots had logged a large percentage of their flight experience in small single-engine airplanes and had minimal actual instrument flight experience flying in clouds (NTSB, 1993a).

One unusual company cost saving strategy central in this accident was GP Express's policy to provide only one aeronautical approach chart to each crew which, during this accident, was held by the first officer. As pressure built the new captain became disoriented, overwhelmed and increasingly reliant on the first officer's erroneous flight guidance. Yet without a chart for verification, the captain had no way to identify the copilot's mistakes or reorient himself (NTSB, 1993a).

Approximately three minutes prior to impact, the first officer joked sarcastically about the captain's obvious task saturation: "Didn't realize that you're going to get this much on your first day did ya?"

"Well, it's all kind of ganged up here on me a little fast", the captain confessed (NTSB, 1993a: 5).

Two minutes later, the captain discussed executing a 'missed approach'—akin to going around for another try—but the first officer convinced him to continue the landing. They crashed one minute later (NTSB, 1993a).

Case 3: 1992 Scenic Air Tours Flight 22

A third example of a fatal aviation accident caused by oversight failures and a young pilot who lacked 'seasoning' involved a commercial sightseeing company on the Island of Maui in Hawaii in 1992. The 26 year old captain had been employed by Scenic Air Tours for about eight months prior to the accident and took off in a 1957 Beech-18 on the 'Volcano Special' sightseeing tour. Although the flight was single-pilot visual operations, not certified for instrument conditions, the captain entered the clouds over Mount Haleakala and became disoriented, colliding with the rising terrain and killing all nine people onboard (NTSB, 1993b).

Particularly disturbing was the post-accident discovery that the young captain, eager to advance his commercial aviation career, falsified his employment application stating that he had accumulated 3,200 flight hours when in fact he only had about 1,600—well below Scenic Air Tours 2,500 minimum. Over the previous four years he had worked for at least nine different aviation employers, five of whom dismissed him for cause such as "below standard work", "failure to report for duty", "poor training performance" and "misrepresentation of qualifications" (NTSB, 1993b: 14). Yet this information was not made available to Scenic Air Tours.

In the ten years prior to this disaster, the NTSB investigated twelve sightseeing company accidents resulting in 96 fatalities of which six crashes were caused when, similar to Scenic Air, a fully functioning aircraft was mistakenly

flown into the ground. These commonalities prompted more questions about safety, training and oversight in the aviation industry, in particular, the FAA's failure to require that commercial operators conduct a substantive background screening of pilots before employment. In at least three accident investigations between 1987 and 1992, the NTSB urged the FAA to require aviation employers to screen pilots more thoroughly. Yet, the FAA dismissed these recommendations believing that the benefits of these requirements would not outweigh the cost of promulgating and enforcing the new regulations (NTSB, 1993b).

Case 4: 1993 GP Express Proficiency Checkflight

A fourth example of a fatal airplane crash involving young pilots who had quickly worked their way up the commercial aviation ranks during the rapid expansion of the post-deregulation period, occurred at 11:50 pm in 1993 in Shelton, Nebraska. The official purpose of this flight was for a company check airman, age 28, to administer a required proficiency check to another check airman, age 29, both commuter airline captains at GP Express Airlines. Yet the actual goal of the flight emerged to be a late night opportunity for the two young pilots, known to be good friends who liked to joke around, to conduct unauthorized aerobatic maneuvers in their Beech C-99, a 15-seat turboprop airplane (NTSB, 1994).

The flight started with the accident pilot asking the check airman if he was "up for a 'vertical thing'" on takeoff as he radioed company ground personnel at the airport to "look out the window" and watch (NTSB, 1994: 12). Once airborne they continued with other stunts including a lethal 'aileron roll' maneuver which,

moments prior to ground impact, both pilots confessed never attempting before. Post-crash investigation revealed that an 'Airmen Competency/Proficiency Check Grade Sheet', the FAA paperwork required to document completion of the required flight maneuvers, was found in the check airman's company mailbox—already filled out. Clearly, the pilots never intended to conduct a proper FAA check ride. Based on this evidence, the NTSB determined that both pilots were willing participants in the unauthorized, hazardous aerobatic maneuvers violating company policies, FAA regulations and the tenants of prudent airmanship. They also cited the failure of GP Express management to establish and maintain a corporate culture committed to pilot professionalism and safety (NTSB, 1994).

Safety Implications

Evaluating the commonalities between the accidents discussed above reveals some compelling 'systemic' similarities highlighting industry-wide problems with pilot training, FAA oversight, and the ways airlines screen and hire new employees, schedule inexperienced crews and measure competency in this new generation of pilots. Six of the seven accident pilots were less than thirty years old, had acquired initial airplane experience as a civilian pilot flying small single-engine airplanes and were hired between 1987 and 1991—the rapid post-deregulation expansion period—with minimal flight experience. Progressing quickly up the commercial ranks, more than half of these young pilots found themselves in the captain seat within months of initial employment just as TWA training Captain Laursen had cautioned against.

Four of the accident pilots crashed within their first eight months of employment—one on his very first day as an airline pilot. And almost half had a documented history of serious performance problems with previous aviation employers which was never communicated to new employers. These examples of basic skill deficiencies—both technical and teamwork—become particularly alarming at the commercial pilot level because, as Captain Larry Rockliff Vice President of Training at Airbus observed: “Once you’re already in the profession” employed as a airline pilot “and simply transferring or transitioning from one aircraft type to the next, it’s very, very late to be teaching basic skills that were missed” (NTSB, 2004: 239).

1996 White House Commission on Aviation Safety and Security

These accident trends did not go unnoticed. By the early 1990s, safety analysts predicted that even if aviation industry accident rates remained constant, the anticipated 3-4% annual industry growth would result in a near doubling of US air crashes by the turn of the 21st century. In global terms, this meant an airline crash every week worldwide by 2015 (Gore, 1996). This information, among other sobering insights, caused the FAA to slowly awaken to their daunting challenge: how to enforce aviation safety during the rapid industry expansion caused by deregulation. They conceded they were having difficulty keeping up.

For instance, the average time to produce a new regulation, even one with urgent safety consequences, was three to four years. Motivated aviation lobbyists often drove the rate of industry change through select projects. The

implementation of important innovations was often stymied by overly conservative financial concerns. And new regulations, such as those recommended by NTSB accident reports, were often rejected simply because the odds of another mishap occurring was so remote it could not justify the costs.

Prompted by these concerns as well as the mysterious mid-air explosion of TWA Flight 800, the inflight fire onboard ValuJet Flight 592 and the corresponding 340 total fatalities, President Bill Clinton created the *White House Commission on Aviation Safety and Security* led by Vice-President Al Gore in 1996. The Commission recommended a re-engineering of the FAA's regulatory and certification programs with the goal of reducing aviation accidents by a "factor of five within a decade". Stuart Matthews President of Flight Safety Foundation succinctly noted "the FAA was simply never created to deal with the environment that has been produced by deregulation of the air transport industry" (Gore, 1996: 1.1). Although that observation was made almost fifteen years ago, little has changed in terms of regulatory oversight of airline pilots in large part due to cost (Fraher, forthcoming). Even with all this evidence, finance continues to trump safety in US aviation.

An ALPA Point Paper

These concerns attracted attention from labor unions. In 2009 ALPA produced a white paper, entitled "*Producing a Professional Airline Pilot: Candidate Screening, Hiring, Training, and Mentoring*", discussing how the fallout from 9/11 significantly changed the airline industry. They noted how the current business

models at most major air carriers encouraged companies to cut costs by parking larger airplanes and furloughing more experienced and therefore more expensive pilots—the seasoned, predominantly ex-military employees the industry lacked—shifting flying to commuter affiliates and less experienced pilots to save money. This strategy has proven to be especially profitable over the past few years, increasing major airlines' virtual network while reducing overhead costs. A Delta 737-300, for instance, requires 81 passengers to break even but their commuter partner Comair only requires 21 flying a regional jet on a similar route (US Department of Transportation, 1998). And an average Delta pilot earns about \$120,000 per year while a Comair pilot averages \$36,000 (www.glassdoor.com).

For years strong unions like ALPA controlled this outsourcing at major air carriers through contract negotiations and threat of labor group 'job action'. But after 9/11, with most contracts voided by bankruptcy judges and labor unions in fear for their survival, airline management was free to negotiate anew and regional airlines now jumped at the chance to expand service. Delta Air Lines, for instance, now has nine commuter airline affiliates—Atlantic Southeast Airlines, Chautauqua, Comair, Compass Airlines, Freedom Airlines, Mesaba, Pinnacle, Shuttle America and SkyWest flying a variety of aircraft under the Delta Connection name—yet another example of the fragmentation of the airline industry today (www.delta.com). Yet, prioritizing short-term financial gains over other long term factors like safety in aviation continues to come at a high cost.

Case 5: 2009 Colgan Air

Take for example the Colgan Air turboprop operating as Continental Connection Flight 3407, which crashed five miles from their destination in 2009 killing all forty nine onboard and one person on the ground. Similar to previously discussed accidents, both the captain and first officer had limited experience flying complex aircraft in icing conditions, had trained in accelerated civilian flight programs logging a large percentage of their flight time in small single-engine airplanes, and found themselves over their heads in a challenging situation made progressively worse by their own inexperience (NTSB, 2009a).

On approach for landing to Buffalo-Niagara International Airport the captain, flying the aircraft in icing conditions, allowed the airplane's speed to become dangerously slow. This caused activation of a stall warning device called a 'stick shaker' which turned off the autopilot and vibrated the control yoke indicating impending stall, as designed. Although the airplane was not yet stalled and in no real danger the captain, apparently startled by the warning, confused by the autopilot disconnection and concerned by the icing, panicked, raising the nose further, ultimately losing control of the aircraft. The NTSB (2009a) concluded that the captain's inappropriate nose-up inputs caused the airplane's wing to stall, not the icing conditions. If he had responded properly, the airplane would have likely recovered sufficient airspeed and avoided ground impact (82).

The cockpit voice recorder (CVR) revealed that both pilots were not properly monitoring the aircraft instruments, distracted instead by nonessential

communications such as commuting, applying to major airlines, changing aircraft, upgrading and the copilot's annual gross salary of \$15,800. This lack of situational awareness was compounded by fatigue as both pilots, yawning repeatedly throughout the flight, had apparently commuted to the Newark airport the night before, sleeping in the flight crew lounge purportedly to save money (NTSB, 2009a).

Although the 47 year old captain had over 3,000 total flight hours and two years experience as captain on other aircraft, he had minimal familiarity with the accident aircraft and only 109 flight hours. He was hired in 2005 with only 618 hours of which 250 were accumulated at Gulfstream Training Academy in Florida, a professional training program for aspiring airline pilots (NTSB, 2009a). Students enter the seven month program with as little as 200 flight hours and no college degree as long as they possess an FAA commercial certificate with instrument and multiengine ratings. In exchange for over \$32,000 in tuition, students receive accelerated training and an opportunity to log 250 flight hours as a turbo-prop copilot flying for their affiliated regional carrier, Gulfstream International Airlines. After completion most pilots, like the accident captain, have enough flight time to land an entry level job at one of the many US commuter airlines (<http://www.gulfstreamtrainingacademy.com>). Yet questions remain about the quality of this preparation for the fast paced, challenging environment that lies ahead for them (ALPA, 2009).

Although the accident captain's training records showed that he successfully completed the Gulfstream program, he had several documented areas of difficulty with aircraft control. For example, he had "deviation from altitude 200-300 feet", difficulty with "airspeed control", slowed below safe airspeed on landing approach and was "graded unsatisfactory in 'approach to stall—landing configuration'" maneuvers—all deficiencies on the night of the accident (NTSB, 2009a: 92). Prior to attending the academy, he failed three FAA check rides and then later, at Colgan, his Airline Transport Pilot certificate; All requiring remedial training before he subsequently passed (NTSB, 2009a: 10).

At Colgan, the accident pilot was promoted to captain within two years of employment completing the one day 'captain upgrade training' designed to help new captains transition to their new role and responsibilities. Although Colgan's director of training described the course as focusing "on captains' duties", "expanded work activities", and crew resource management, the majority of the day was actually spent covering administrative requirements. In fact, of the six hours and forty-five minutes scheduled, less than two hours and just eleven PowerPoint slides covered "leadership", "situational awareness" and teamwork on the flightdeck (55). Although this may be surprising, once again, "captain leadership training is not mandated by the FAA" (55).

The 24 year old copilot had been hired a year before the accident with about 1,600 flight hours accrued through two years of part-time flight instructing in Phoenix, Arizona. By her own admission "all of that [flight time] in Phoenix"

was of little help to her once employed at the airline. “I had more actual [instrument] time on my first day” at Colgan Air “than I did in the sixteen hundred hours I had when I came here”, she joked to the captain on the day of the crash (NTSB 2009a: 291). Eager to move up in order to make more money, but clearly uneasy with her operational inexperience, she shared “I really wouldn’t mind going through a winter in the northeast before I have to upgrade to captain”. And in an eerie case of foreshadowing about five minutes before the crash, she further confirmed her uneasiness: “Back in Phoenix, if I’d “seen this much ice”, I’d “thought oh my gosh, we were going to crash. I would have ‘freaked out’” (278). “I’ve never seen icing conditions. I’ve never deiced. I’ve never seen any—I’ve never experienced any of that” (NTSB 2009a: 291).

The FAA’s ‘Call to Action’

The Colgan Air accident so shocked America in 2009, Congress convened a hearing and the FAA hosted twelve regional meetings investigating the NTSB’s findings regarding pilot training and qualifications, flight crew fatigue, and consistency of safety standards between operators. Four key areas were identified as needing improvement by the FAA (2010: 5) in a two hundred page report entitled “*Answering the Call to Action on Airline Safety and Pilot Training*”:

- 1) Air carrier management responsibilities for crew education and support;
- 2) Professional standards and flight discipline;
- 3) Training standards and performance;
- and 4) Mentoring relationships between mainline carriers and their regional partners.

The report identified several concerns for airline managers

such as “the importance of a safety culture”; pilot scheduling and “fatigue concerns”; the “need to pay a ‘living wage’”; and “the need for better screening of pilots” rather than “ ‘cookie-cutter’ solutions solely based on flight time” (19).

Encouragingly, the FAA (2010: 22) noted, “The single defining theme from the many discussions conducted around the country” after the Colgan Air accident “was that a focus on quality, not just quantity” is essential. While total flight time measurement “*can* be an indicator of a pilot’s proficiency and suitability” for airline operations “quality of training and quality of experience are far more important in determining an individual’s readiness to operate in the air carrier environment”. What seems to be universally recognized is that “a generational ‘paradigm shift’ in the pilot population” is occurring involving “a fundamental shift in experience, expectations, and work practices” which requires corresponding training and managerial changes. However, there is no consensus on what those changes should include. Yet, the concept of liminality may help bring this complex situation into clearer view.

IV. Liminality—A Useful Descriptive Concept

Liminality is a useful descriptive concept because, rather than blaming individuals, liminality highlights the socio-analytic factors and resultant containment shortfalls of the system-as-a-whole. Derived from the Latin word for threshold or *limen*, the word liminal was first applied in social science in 1909 by French anthropologist Arnold van Gennep who used it to describe ‘rites of passage’ or rituals which denote changes in “place, state, social position and

age" (Turner, 1969: 94). Van Gennep theorized that all rites of passage are marked by three phases: *Separation*, signifying detachment from a previous state; *Limen*, the transition period; and *Aggregation*, when passage is consummated and stability is achieved. Turner (1969: 95) added to this definition by emphasizing that the attributes of liminality are necessarily ambiguous since liminal entities "are betwixt and between"; in transition between established roles within the organization.

Several recent case studies have productively examined work performance through a lens of liminality and provide a way to comprehend the results of this unique shift (Elmes and Barry, 1999; Garsten, 1999; Tempest, Starkey and Ennew, 2007). Two of these studies focused on the Mount Everest climbing disaster which killed eight people in 1996. Until fairly recently, Mount Everest remained the preserve of the world's most elite mountaineers who passed death defying rites of passage under apprenticeship to senior climbers on smaller mountains in order to learn the culture, norms and rules of their profession.

Then, in 1985, a wealthy businessman named Dick Bass forever changed the field, climbing the highest peak of each continent suggesting "anyone can climb if they have enough money and training" (Elmes and Barry, 1999: 168). Over the next decade, large numbers of commercial climbing companies emerged charging clients upwards of \$70,000 to ascend mountains like Everest. As a result, high-skilled experienced climbers with internalized norms and rules of their field, and ideals of discipline, professionalism, humility, respect for the

mountain and Sherpas as partners, gave way to liminal, less-skilled, undisciplined client-climbers with little knowledge of the field or respect for cultural norms and a higher potential for denial, rationalization, self-aggrandizement and entitlement (Elmes and Barry, 1999: 179).

These changes had an impact on teamwork and the workload of team leaders in troubling ways (Elmes and Barry, 1999; Tempest, et al, 2007). Inexperienced, liminal mountaineers in ambiguous roles as both customer and climbing team member created particular management challenges. Driven by personal ambitions, client-climbers had little time or desire to coalesce as a team, and working in challenging and unfamiliar environments they could easily stretch beyond their personal competencies with dire consequences for the group as a whole. These factors combined to cause "a shift in the work-group cultures of high-altitude climbing teams, from more collaborative, high-learning, intentional group cultures to more regressive, low-learning, dependent group cultures" where competition for customers increased team leader pressure to get clients to top (Elmes and Barry, 1999: 165-6). In 1996, this dependency dynamic resulted in organizational overreach, team breakdown and death on top Everest, evidencing that "there are genuine limits to management practice in the contexts of liminality" (Tempest et al, 2007: 1040). This suggests "managers need to find ways to temper their drive to succeed with an awareness of and reflection upon the restrictions that businesses face in such settings" (Tempest et al, 2007: 1040).

There are similarities between the findings in the Mount Everest liminality studies and aviation culture today. First, the culture of individualism whereby liminal workers are valued in the short-term for what they can immediately contribute but are responsible for their own life-long career development and training proved dangerous on Mount Everest and in the five aviation accidents previously discussed. In such contexts, the organization increasingly relies on individuals' professionalism and personal discipline to provide the containment these high risk teams need to operate safely. Yet, too great a burden is placed on the liminal—often inexperienced—worker's individual ability to assess their skill level, manage themselves in role and determine safe boundaries. With little capacity for self-evaluation, client-climbers relied on their charismatic team leaders to manage the group's task and provide containment like inexperienced copilots can rely on captains. Yet, just as the previous examples evidence, this dynamic places an inordinate amount of pressure on climbing team leaders and also airline captains, who may not have a great deal of aviation experience either.

Like mountaineers decades ago, previous generations of commercial pilots learned the culture, norms, and rules of their field through years of 'apprenticeship' under other pilots, usually in the military. As accelerated airport training academies emerged, new pilots now had the opportunity to 'pay for training', essentially buying a flightdeck seat after only a few months of training without necessarily learning the important lessons to survival, just like Everest

client-climbers. In both cases, a tacit assumption remains that although they often lack the background, education and operational experience of previous workgroups, these liminal workers are nonetheless savvy enough to know their limits and will not endanger others. Obviously, this is not always true.

Trapped 'betwixt and between', aspiring pilots are eager to land air carrier jobs, log airline flight time and upgrade to captain as soon as possible, in hopes of advancing their aviation careers. In fact, the need to earn a livable wage—often to pay back high interest flight training loans—demands this transition. Yet, eager inexperienced pilots can easily find themselves over their heads in challenging situations without the requisite skill set to survive. Meanwhile weak regulations, financial pressures, employee turnover and fragmented networks make commuter airlines—often the first rung of the civilian pilot's career ladder—the least able to provide the 'apprenticeship' these fledgling commercial pilots need. As evidenced by the accidents discussed above, airline managers' fixation on financial bottom-lines and lack of attention to pilots' liminal state fostered a regressive culture which Tempest et al's (2007) liminality study cautioned against. The loss of containment once provided by corporate culture, strong labor unions, supportive management, clear contracts, fair work rules, established seniority lists and defined career paths that included significant operational experience has resulted in pilots' development of defenses to compensate for containment shortfalls. As Sir Edmund Hillary noted, mountaineering "used to be a team effort. Nowadays, it's much too 'everybody-

for-himself.' That can get you killed" (cited in Elmes and Barry, 1999: 175). The same could be said for aviation.

Evidence of Liminality in Aviation Today

The lack of containment in this liminal environment makes it particularly difficult for airline employees to concentrate on job performance at work. Take for example the Northwest Airline pilots who, out of radio contact for an hour, overflowed their Minneapolis destination by 150 miles in October 2009 with 147 passengers onboard. After investigating the incident, the NTSB reported, "The crew stated they were in a heated discussion over airline policy and they lost situational awareness" (CNN, 2009a).

That same week, a Delta Air Lines crew also lost situational awareness when they landed their 767 with 194 passengers on a taxiway at their hub airport, Atlanta-Hartsfield International, instead of their assigned runway (CNN, 2009b). Just months before these two incidents, Delta had acquired Northwest through merger, creating what one airline analyst called the "tsunami of airline consolidations" (AP, 2006). The deal nearly fell through when a standoff emerged between the 7,000 Delta and 5,000 Northwest pilots' unions, each wanting greater seniority for their labor group.

In another post-9/11 labor-related incident, United Airlines was forced to cancel a flight in 2008 when the captain announced to passengers that "he was too upset to fly" after a dispute with another employee about wearing his hat.

The pilots' union had urged pilots to remove their hats in protest of a managerial decision setting aside yet another \$130 million in stock in an executive incentive plan while cutting routes and laying-off employees. It was a sign "to show management that" pilots were "serious about regaining what was stripped" from employees "during bankruptcy" (Yu 2008: 3B).

Even the 'hero' pilots who landed their crippled Airbus on the Hudson River in 2009, Captain 'Sully' Sullenberger and First Officer Jeff Skiles, found themselves pondering the impact of airline mergers on the morning of their fateful accident (NTSB, 2009b).

"Wonder how the Northwest and Delta pilots are getting' on", Skiles remarked as a Northwest jet taxied behind them during engine start at LaGuardia.

"I wonder about that too", Captain Sullenberger responded, "I have no idea...hopefully better than we and [America] West do".

"Be hard to do worse".

"Yeah...Well I hadn't heard much about it lately but I can't imagine it'd be any better", Sullenberger replied (NTSB, 2009b: 22).

Although technically a violation of the FAA's sterile cockpit rules, these types of conversations are common on the flightdeck of nearly every airline today as pilots' struggle to cope with the drastic changes that have befallen their

profession and the ensuing liminal state. Even once aggressive labor groups now shied away from confronting airline management, fearing repercussions. Take the *Airline Mechanics Fraternal Association* strike at Northwest Airlines in 2005 when 4,400 mechanics and aircraft cleaners walked off the job, angry about the company's demand for \$176 million in wage and benefit concession and a 53% loss of jobs (Maynard, 2005).

In an unprecedented reaction pilots, flight attendants and other labor groups refused to strike in sympathy. Apparently an 'open secret', Northwest executives had been preparing for eighteen months, reorganizing maintenance practices in an effort to replicate JetBlue's business model, outsourcing major aircraft maintenance to specialized subcontractors. Managers had no problem recruiting and training 'replacement' workers since about 130,000 experienced mechanics, furloughed from other airlines, were looking for work. Northwest executives even convinced the Bush administration not to order strikers back to work in accordance with the Railway Labor Act, preferring more time for their plan to evolve (Maynard, 2005).

The chaotic state of the post-9/11 aviation industry generated such widespread concern in Congress that the Government Accounting Office (GAO) was tasked to investigate the implications of airline bankruptcies, mergers, loss of pension plans, high fuel prices and even re-regulating the struggling industry (See for example, US GAO, 2002a; 2002b; 2004; 2005a; 2005b; 2006; 2008;

2009). One study claimed that “the airline bankruptcy process is well developed and understood” even discussing the liquidation of employee pension plans and offering examples of the significant loss of benefits senior airline employees will experience when they retire. Yet they nonetheless claim there is “no evidence” that bankruptcy “harms the industry” (US GAO 2005b: 19 and 27). Another report noted “The historically high number of airline bankruptcies and liquidations is a reflection of the industry’s inherent instability” (US GAO 2005a: 20). Yet, it did not investigate the implications of this instability and lack of containment for employees. In fact, not one of the government’s reports discussed the impact of this tumultuous liminal climate of outsourcing, mergers, downsizing, furloughs and changing work rules on teamwork, employee job performance or safety.

Yet, Captain Sullenberger (2009) made the connection between airlines’ fixation on the financial bottom line and its impact on employee performance and safety. Voicing experienced pilots’ concerns, he noted that aviation employees “have been hit by an economic tsunami”. The “terms of our employment have changed dramatically” and the managerial decisions placing “less experienced and less skilled” pilots on flight decks today will have “negative consequences to the flying public—and to our country”. As a result, “I am worried that the airline piloting profession will not be able to continue to attract the best and the brightest” which is “vital to safe air travel and our country’s economy and security”. It is time for airlines to “refocus their attention—and their resources—

on the recruitment and retention of highly experienced and well-trained pilots” making “that a priority that is at least equal to their financial bottom line.”

ALPA (2009: 1) was even more pointed in its criticism, observing that unless significant changes are made in “today’s archaic regulations” airlines will continue “to hire low-experience pilots into the right seat of high-speed, complex, swept-wing jet aircraft in what amounts to on-the-job training with paying passengers on board”. The only solution is “a complete overhaul of pilot selection and training”.

The concept of liminality then allows us to perceive how contemporary conditions in US commercial aviation have created a situation of both heightened risk and increased opportunity (Garsten, 1999). The risks have been well documented in this essay. As both Captain Sullenberger and the ALPA report have underscored, the time is ripe for a transformation of the system of aviation. Whether we take advantage of this opportunity to press for the necessary changes and reprioritize safety remains to be seen. Just like the early days of aviation, government institutions are caught trying to catch up and regulate after the fact.

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