U.S. Department of Transportation

Office of the Secretary of Transportation

The Inspector General

Office of Inspector General
Washington, DC 20590

February 9, 2011

The Honorable John D. Rockefeller IV
Chairman, Committee on Commerce,
Science, and Transportation
United States Senate
Washington, DC 20510

The Honorable Kay Bailey Hutchison
Ranking Member, Committee on Commerce,
Science, and Transportation
United States Senate
Washington, DC 20510

The Honorable Jim DeMint
Ranking Member, Subcommittee on Aviation
Operations, Safety, and Security
Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Chairman Rockefeller and Ranking Members Hutchison and DeMint:

Thank you for your May 18, 2009, letter requesting that we determine whether there is a direct relationship among commercial aviation accidents, pilot experience, and pilot compensation. Your request was also reiterated by Representatives Louise Slaughter, Brian Higgins, and Christopher J. Lee. This request was prompted by safety concerns raised after the fatal crash of Colgan flight 3407 in February 2009. The National Transportation Safety Board's (NTSB) investigation into the accident and subsequent congressional hearings underscored the need to address longstanding pilot fatigue and training issues and raised concerns about pilots with low levels of experience, low pay, and long commuting distances. To respond to your request, we analyzed the experience (i.e., total flight time[1] and total make and model flight time[2]

[1] Total flight time—whether gained through military, general aviation, or other air carrier operations—represents a pilot's entire career.

[2] Make and model hours measure a pilot's level of knowledge and familiarity with flying that type of aircraft.

in the accident aircraft) of pilots involved in 322 scheduled Part 121[3] passenger accidents that occurred from January 2000 through December 2009. We also assessed the flight time and the 2009 salaries of more than 1,900 pilots from 5 air carriers. In addition, we examined studies on commercial aviation accidents and interviewed officials from more than 20 Government and industry groups (see enclosure for details of our review scope and methodology). The portion of your request concerning the regulations and oversight for pilot training and fatigue will be reported separately at a later date.

Notwithstanding the range of pilot issues explored during the aftermath of the accident, we were unable to identify a direct relationship among *all three factors*—commercial aviation accidents, pilot experience, and pilot compensation. This is because the Federal Aviation Administration (FAA) and NTSB do not typically collect compensation information for pilots involved in accidents.[4] Therefore, we assessed the relationship between commercial aviation accidents and pilot experience and then the relationship between pilot experience and compensation.

- We could not identify a direct relationship between accidents and pilot experience because pilots involved in accidents had a wide range of both total and make and model flight times. However, we observed fewer accidents among pilots who had more flight time in the aircraft make and model. In addition, we found that factors beyond flight experience—such as training, professionalism, and mentoring—play a key role in pilot performance.

- We found only a weak relationship between pilot experience and compensation because pilots' level of pay is usually based more on their seniority with the airline company instead of their total flight time. Compensation levels also vary significantly depending on seat (i.e., captain or first officer) and aircraft type. Generally, the larger the aircraft, the higher the compensation.

Given the many issues identified during the Colgan hearing, both FAA and Congress have made several strides to improve aviation safety. FAA proposed a rule to require simulation devices in training programs and recently published a proposed rule to revamp pilot rest and duty requirements. Most notably, in August 2010, Congress enacted a law mandating several safety improvements and setting deadlines for rulemakings.[5]

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[3] 14 CFR § 121, Operating Requirements: Domestic, Flag, and Supplemental Operations. Part 121 accidents primarily involve mainline and regional air carriers with scheduled flights. Mainline air carriers are major airlines that generally operate aircraft seating 100 or more passengers. Regional air carriers are airlines that generally operate aircraft seating 99 or fewer passengers.

[4] We attempted to obtain compensation data on pilots involved in major accidents from two air carriers. One air carrier was unresponsive to our request, while the other cited privacy concerns and indicated that the data may no longer exist. Instead, the selected air carriers agreed to provide compensation and experience data for a sample of their active pilots.

[5] The Airline Safety and FAA Extension Act of 2010, Pub. L. No. 111-316 (August 1, 2010).

The results of our analysis are further discussed below. We would be pleased to provide a detailed briefing at your request.

Flight Experience Varied for Pilots Involved in Accidents

The NTSB's public hearing on the Colgan accident identified the experience level of the Colgan pilots as a possible concern. Specifically, the Colgan captain only had 111 hours of total flight time in the accident aircraft type (Bombardier Q400) and had four FAA certificate disapprovals—meaning he could not demonstrate the necessary knowledge, skills, and abilities to safely operate the tested aircraft type. However, the relatively low experience level of the Colgan captain appears to be an anomaly when compared to the experience level of the captains in the nine other *major* accidents over the last decade.[6] The nine other captains all had more than 1,100 total flight hours in the make and model of the accident aircraft. In addition, the Colgan captain received more FAA certificate disapprovals than any other pilot involved in a major accident. Also, he was the only pilot who received disapprovals for both the commercial and airline transport pilot (ATP) certifications.[7]

Apart from the Colgan accident, the pilots involved in the other 321 accidents we reviewed had a wide range of flight hours—both in total flight time and total flight time in the aircraft make and model (see table 1). Regardless of these differences, all were involved in major and non-major accidents. Given the wide ranging flight times of these pilots, we could not determine a direct relationship between pilot experience and accidents.

Table 1. Range of Flight Hours for Captains and First Officers Involved in 322 Scheduled Part 121 Passenger Accidents

Pilot Factors	Mainline		Regional	
	Captain	***First Officer***	***Captain***	***First Officer***
Total Flight Hours				
Range in Total Flight Hrs.	2,941 → 38,578	413 → 22,000	1,595 → 36,768	325 → 11,997
Average Total Flight Hrs.	12,980	7,361	6,408	3,021
Total Accident Aircraft Make & Model Hours				
Range in Make & Model Hrs.	50 → 23,500	5 → 9,674	31 → 10,675	15 → 4,040
Average Make & Model Hrs.	4,556	2,099	2,345	983

Source: OIG analysis of NTSB's database of scheduled Part 121 passenger accidents that occurred from CYs 2000-2009

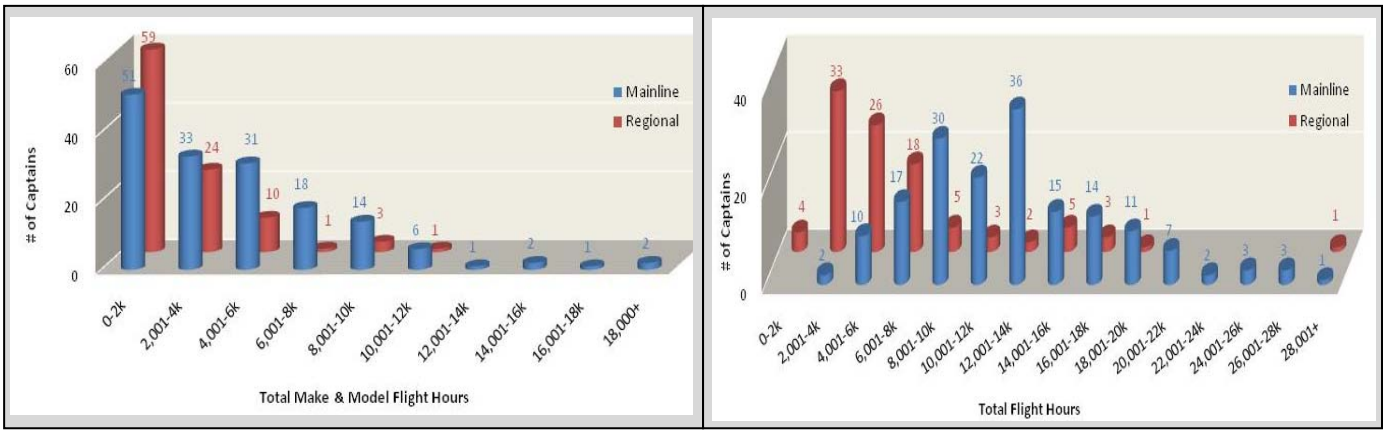
However, we observed that fewer accidents occurred for pilots who had more hours of flight time in the accident aircraft make and model. That is, as flight time in the

[6] Of the 322 scheduled Part 121 passenger accidents from the last decade, the NTSB classified only 10 as "major," including the Colgan accident. NTSB classifies an accident as a *major accident* if one of three conditions occurs: (1) an aircraft was destroyed, (2) there were multiple fatalities, or (3) there was one fatality and an aircraft was substantially damaged. However, NTSB has initiated major *investigations* on Part 121 aircraft accidents that do not meet the definition of a major accident. For example, the ditching of the US Airways flight 1549 into New York's Hudson River in January 2009 was not classified as a "major accident" but did involve a major investigative effort by the NTSB.

[7] The ATP is the highest level of pilot certificate and a prerequisite for a captain seat in scheduled airline operations.

aircraft *make and model* increased, the number of pilots involved in accidents decreased (see figure 1 below).[8]

Figure 1. Captains' Flight Time in Aircraft Make/Model and Total Flight Time in Accidents



Source: OIG analysis of NTSB's database of scheduled Part 121 passenger accidents that occurred from CYs 2000-2009. No bar for a flight time category indicates that no captains with that flight time were involved in an accident.

Finally, our assessment of the 322 accidents mirrored that of NTSB with respect to pilot performance as a high-ranking causal factor in accidents.[9] Further, pilot performance was cited in 7 of the 10 major accidents that occurred over the last decade, including the Colgan accident. Pilot performance includes situations of poor decision making, inadequate aircraft control, improper flying techniques, and/or a disregard for operating procedures. These issues indicate that factors beyond flight experience are also important, such as quality of training, professionalism, and mentoring. Although most investigations of non-major Part 121 accidents do not capture many of these factors, pilot performance continues to be a focus area. Congress included some of these factors in the recent Airline Safety and FAA Extension Act of 2010 as new requirements for Part 121 carriers, affirming that safety is still a shared responsibility among FAA, air carriers, aircraft manufacturers, and the pilots. These new requirements include establishing flight crewmember mentoring programs, professional development committees, and new training programs to accommodate different levels and types of flight experience. The new law also requires that all Part 121 pilots hold an ATP certificate. Currently, only captains are required to hold an ATP certificate.

[8] However, without a control group of non-accident pilots to compare our results against, we cannot determine the significance of these accident distributions.

[9] In determining probable cause, NTSB considers all facts, conditions, and circumstances associated with the accident. We use the term "causal factor" to encompass the causes and factors that contribute to the accident as identified by NTSB.

Pilot Compensation Is Primarily Related to Seniority, Not Experience

The NTSB's public hearing on the Colgan accident highlighted the compensation of the first officer as a possible factor in the accident.[10] However, we found only a weak relationship between pilot experience and compensation because the pilots we reviewed generally did not receive high salaries as a result of their high total flight time. Rather, compensation in the Part 121 industry is seniority-driven, not experience-based. For example, a regional first officer who had over 12,000 total flight hours (a high level of flight time) earned $34,174 in 2009. In this instance, the pilot's salary did not reflect his experience level. Conversely, some pilots had high salaries even though they did not have much total flight time.

Seniority allows the pilot to bid on seat and aircraft type; flying a larger aircraft usually means higher compensation. With the example above, the first officer's low salary was driven by his low seniority ranking in the airline (he was hired in 2006). In addition, some pilots use their seniority and choose quality of life over higher compensation. For example, while a senior first officer would have the option of upgrading to become a junior captain, the pilot may choose to forego a captain's higher pay for the option of being able to pick better days off and fly preferred routes.

In addition, we compared the average total flight time and average 2009 salary of the mainline and regional carriers from the five air carriers in our sample. We found that mainline pilots—who generally fly larger aircraft—had, on average, higher compensation and more experience (total flight time) than their regional counterparts. In addition, they were employed with their airline longer than regional pilots. In fact, mainline captains earned, on average, more than twice as much as their regional counterparts, and mainline first officers were, on average, compensated higher than regional pilots (see table 2 below). These results are consistent with operational differences highlighted by the Air Line Pilots Association's testimony[11] in June 2009: regional air carriers generally tend to have newer pilots who accumulate flight time in smaller aircraft and use that experience as a stepping stone to the more lucrative pay at a mainline air carrier.

[10] NTSB calculated that the Colgan first officer, who was hired on January 16, 2008, made $15,800 that year.

[11] Hearing before the U.S. House of Representatives Subcommittee on Aviation, Committee on Transportation and Infrastructure, "Regional Air Carriers and Pilot Workforce Issues," June 11, 2009.

Table 2. Average Flight Time, Salary, and Seniority

Type of Part 121 Carrier	Captain				First Officer			
	Number of Pilots in Sample	Average Total Flight Hours*	Average 2009 Salary	Average No. of Yrs. with Airline**	Number of Pilots in Sample	Average Total Flight Hours*	Average 2009 Salary	Average No. of Yrs. With Airline**
Mainline 1	137	14,686	$166,259	22.0	156	9,724	$106,057	11.4
Mainline 2	200	13,311	$162,508	23.9	235	8,064	$110,471	16.0
Mainline 3	267	NA	$194,235	13.1	268	NA	$107,560	4.6
Subtotal	**604**	**13,870**	**$177,384**	**19.3**	**659**	**8,727**	**$108,242**	**10.4**
Regional 1	137	10,495	$74,175	11.0	129	4,175	$34,338	4.1
Regional 2	219	13,682	$87,915	15.9	186	4,868	$37,343	4.9
Subtotal	**356**	**12,456**	**$82,628**	**14.3**	**315**	**4,584**	**$36,108**	**4.6**

* Mainline 1 and Regional 1 & 2 provided their pilots' total career flight time, but Mainline 2 could only provide total flight time flown at the airline. Mainline 3 did not maintain either flight time.

** Pilots could include those acquired through airline mergers. For these pilots, the date of hire is the date of their original hiring, not the date that they were acquired through the airline merger.

Source: OIG analysis of a sample of pilot data at five air carriers.

Based on the results of our independent analysis, we are not making any recommendations to FAA regarding the relationship among commercial aviation accidents, pilot experience, and pilot compensation.

Thank you again for your attention to this important issue. If I can answer any questions, please contact me at (202) 366-1959 or Jeffrey B. Guzzetti, Assistant Inspector General for Aviation and Special Program Audits, at (202) 366-0500.

Sincerely,

Calvin L. Scovel III
Inspector General

Enclosure

cc: Federal Aviation Administrator

Scope and Methodology

We conducted this audit between November 2009 and November 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We examined 322 commercial aviation accidents that occurred from January 2000 through December 2009. Our scope is limited to those accidents involving scheduled passenger flights operated under 14 CFR Part 121 by mainline and regional air carriers. Data were primarily gathered from the NTSB database as of May 2010. However, we also collected data from other NTSB products, such as probable cause reports, major investigation reports, and information in the investigation docket.

We conducted a data reliability test on a random sample of 30 accidents. Based on the results, we estimate with 90 percent confidence that the flight time data (i.e., total hours and hours in the accident aircraft make and model) used to draw our findings and conclusions are 93 percent reliable, with a margin of error plus/minus 5.0 percentage points. This projection applies only to the populated fields, which amounted to 83 percent.

Our ability to analyze accident data is limited to the quality and quantity of the data under review. The limitations we discovered have been repeatedly confirmed by the stakeholders we visited and the studies we reviewed. These limitations include:

- Too few accident data points because accidents are uncommon,
- No compensation data available for pilots involved in accidents,
- Not all types of flight time experience included in NTSB accident database, and
- No control group of non-accident pilots to compare our results against.

We obtained pilots' total flight time, 2009 salaries, and seniority ranking from air carriers willing to provide the data. Three mainline and 2 regional air carriers provided information for a total sample of more than 1,900 pilots. Three air carriers provided total career flight time, one provided total flight time flown at the airline, and the final one did not maintain either flight time.

Finally, we examined 10 studies on aviation accidents and interviewed 22 industry stakeholders from various FAA divisions, NTSB divisions, the National Aeronautics and Space Administration, trade associations, and professional organizations.