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September 5, 2008

Mr. William English
Office of Aviation Safety
National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, DC 20594

Dear Bill:

In the interest of aviation safety and to encourage the investigating authorities to make an accurate Final Report, ExcelAire Service, Inc. provides the following comments with respect to the Draft Final Report of Aircraft Accident Involving PR-GTD and N600XL, 29 September 2006. These comments correspond to the Contributors, Clarification, and Details sections of the draft U.S. Comments to Draft Final Report of Aircraft Accident Involving PR-GTD and N600XL, 29 September 2006.

At the outset, ExcelAire notes that the Draft Final Report improperly engages in an ad hominem attack on the company, which was entirely compliant with, and exceeded, applicable aviation regulations with respect to pilot training, pilot qualifications, flight planning, and pre-acceptance inspections that required corrective action to be cleared before delivery. The Draft Final Report overlooks or downplays actions and failures of the Air Traffic Control ("ATC") as Contributing Factors to the accident, and does not adequately address the role played by the avionics on N600XL, all of which ExcelAire addresses in its comments. Indeed, the Draft Final Report consistently hypothesizes to the advantage of the ATC and the disadvantage of the American pilots. ExcelAire is appalled that an official aviation accident investigation report is filled with hypothesis unrelated to the cause of the accident and extremely weak on factual failures of the ATC system and personnel.

The highest levels of the Brazilian military (*i.e.*, Defense Minister Pires) prejudged the pilots, creating a climate of intimidation for those investigating and those being interviewed. The criminalization of the accident and the impact it had on those who needed to be interviewed cannot be understated. This Report appears to be written to protect Air Force employees from Brazil's judicial system, at great expense to ExcelAire and our pilots. The entire investigation was tainted from the start, calling into question the results of the investigation, notwithstanding the efforts of the Safety Board and the Federal Aviation Administration.

By unduly focusing on extraneous events that have no connection whatsoever to this accident, the Draft Final Report violates the spirit and the letter of Chapter 3 of Annex 13, which cautions that the purpose of the investigation is not to apportion blame or liability. That, however, is precisely what the Draft Final Report does, with one branch of Brazil's military assessing fault on the part of others – another branch of Brazil's military and the two American pilots and their American employer.

That said, the Draft Final Report does simply and accurately characterize the contribution of the Air Traffic Controllers to the happening of this accident:

> A series of non-compliances, without a plausible reason, of procedures established through rules and operational models contributed to the accident (p. 267).

Despite the Report's inaccuracies in characterizing the conduct of the pilots, it does make some accurate observations, for instance:

> . . . . the pilots demonstrated to possess the profile of serious and responsible highly experienced professionals, who never deliberately neglected the prescribed procedures. (p. 199).

Adherence to the prescribed procedures was not enough, however. The result, as acknowledged by the Draft Final Report:

> [N]otwithstanding the fact that both airplanes complied with all the instructions received from air traffic control units, they collided while flying enroute at flight level 370, along the axis of airway UZ6. (p. 193).

The Draft Final Report fails to accurately address the fact that this accident was caused by, in its words, "a series of noncompliances" by the Air Traffic Controllers, which the Draft Final Report identifies as follows:

> The following non-conformities were identified in the area of Air Traffic Control:
>
> • Assistant-controller of the Brasilia ACC (São Paulo Region): transmission of the flight clearance in an incomplete manner from Brasilia to São José dos Campos (SJC).
>
> • GRD of the DTCEA-SJ: transmission of the flight clearance in an incomplete manner from SJC to N600XL.
>
> • Controller of sectors 5 and 6 of Brasilia ACC: failure to provide the controller 1 of sectors 7, 8 and 9 with the necessary information when coordinating and handing off the N600XL.
>
> • Controller 1 of sectors 7, 8 and 9 of Brasilia ACC: failure to contact N600XL for a level change; failure to change frequency from sector 9 to sector 7; failure to notice the loss of the mode C on the part of the N600XL; judgment error, assuming that N600XL would be at level 360; non-execution of the procedures prescribed for loss of

transponder in RVSM airspace; and non-execution of the procedures prescribed for control position relief, with omission and/or transmission of wrong information.

• Controller 2 of sectors 7, 8 and 9 of Brasilia ACC: non-execution of the procedures prescribed for loss of transponder and for radar contact in RVSM airspace; non-execution of the procedures prescribed for communications failure; and failure of communication with the assistant-controller.

• Assistant-controller of sectors 7, 8 and 9 of Brasilia ACC; non-execution of the procedure prescribed for the aircraft hand-off to the Amazonic ACC, with omission and transmission of wrong information.

• Controllers 1 and 2 of sectors 7, 8 and 9 of Brasilia ACC: failure to communicate with the supervisors of Brasilia Region.

• Supervisors of Brasilia ACC: non-involvement in the events concerning the control of N600XL.

• Controller of the Manaus Sub-Center of the Amazonic ACC: deviation from standard procedure at the hand-off of the PR-GTD and acceptance of the N600XL; wrong confirmation of the existence of the N600XL traffic; and non-execution of the procedure prescribed for loss of radar contact. (pp. 184-85).

In addition to these individual failures, the accident was the result of systemic failures – failures of supervision in the Air Traffic Control System and failures of the Airspace Control System. As identified in the Draft Final Report itself:

> We could then point toward the possibility of failures caused by defective equipment, poor maintenance of the Airspace Control System.
>
> Once more, the evidence of human failure was a contributor in the communications, overriding the operational capacity of the frequencies and equipment.
>
> However, it is important to emphasize that we are not only talking of individual failures at the execution level, but also of failures at a supervision level.
>
> From what has been analyzed, and to the extent that was possible to reconstitute which frequencies were used by the N600XL, and in what

> sequence they were used, the failures that were found in the communications were generally caused by error of procedures, such as, the incorrect selection of frequencies at the console, failure to inform the correct frequency for the sector, or enlacement of frequency already installed in the VHF site with the audio center of the ACC. (pp. 268-69).

This progression of failures (see pp. 167-71) was the paramount factor contributing to this accident, all entirely preventable.

CONTRIBUTORS

The Probable Cause of this accident is that two aircraft were placed on a collision course by Air Traffic Control. The Draft Final Report gives short shrift to three critical Contributing Factors that allowed this to happen – (1) flight level clearances; (2) ATC's awareness of the transponder failure; and (3) communications and frequency problems. These Contributing Factors should be included in Section 5.2 of the Final Report.

Flight Level Clearances

The Legacy was given a flight level clearance of 37,000 feet to destination, as follows:

> GNDC-SJ: NOVEMBER SIX ZERO ZERO X-RAY LIMA, ATC CLEARANCE TO EDUARDO GOMES, FLIGHT LEVEL THREE SEVEN ZERO DIRECT POCOS DE CALDAS, SQUAWK TRANSPONDER CODE FOUR FIVE SEVEN FOUR. AFTER TAKE-OFF PERFORM OREN DEPARTURE. (p. 42).

The pilots understood this to be a clearance to destination, as revealed in their interviews:

> According to the co-pilot, the controller transmitted the "clearance" for FL370, destination Eduardo Gomes, but omitted the initial altitude. The co-pilot questioned the controller about that, but noticed that there would not be any answer. They passed to the control of the Tower, which confirmed FL080 for the departure.
>
> The Captain said that the non-standard altitude given by ATC is not uncommon: "It is done all the time. Since the ATC informed 37,000 feet, that was our altitude."
>
> The co-pilot said the same, adding that they were en-route, with radar contact, and that they never expected a change from the ATC.

> He added that the clearance sounded correct: he was cleared to Manaus at FL370, and understood that he was to maintain this altitude up to the destination, unless otherwise directed later on.
>
> In the initial interview, the pilots reported that, in the United States, when under radar monitoring, "there is not the custom" of asking for any change of level without the request of the control. (p. 148).

The Draft Final Report acknowledges, as it must, that the pilots' understanding of the clearance as a clearance to destination was reasonable:

> The incomplete clearance transmitted to the N600XL crew favored the understanding by the pilots that they had to maintain FL370 all the way to Eduardo Gomes. (p. 277).

The pilots' understanding was not only reasonable but it was correct. The clearance limit given by Air Traffic Control was Eduardo Gomes Airport.

A flight plan is a statement of intended routing and schedule. An IFR clearance authorizes an aircraft to proceed to a certain point, via a certain route, and at a certain altitude assignment. Every IFR clearance stipulates the height at which an aircraft is to fly. The Air Traffic Controllers' accounts about flight level clearance practices underscore why the pilots' understanding was reasonable in the face of the overriding verbal clearance given:

> The APP operator interviewed said that the standard of the clearances delivered by Brasilia include only destination, heading and level. Regulations prescribe that the entire route has to be informed, including the level change. But the clearance is received from Brasilia in that manner, and he believes the reason is that a sector may not have a complete clearance. It would be necessary that three sectors of the ACC issued the flight plan clearance, and, even so, many alterations could occur along the itinerary of the aircraft. He added that a complete clearance could delay the clearance, as well as the taxi and departure. Besides, she [sic] said that "flight is dynamic, lots of things may change and it could be useless to issue a complete clearance." She also stated that, in São José, one cannot add anything to what is in the clearance issued by Brasilia, and the only one who could question the clearance was the pilot.
>
> Another interviewee, a controller that was in the Tower on the day of the accident, assisting with the communications of the simulation coordinated by INFRAERO, reported that the clearance is always partial, containing the level, airway and "direction". He thinks that it would be unproductive to inform the whole route, since it could be

> implied that no alterations would occur along the "itinerary". . . The Chief of the Operational Section said that he did not see anything abnormal in the clearance: "it was within the standard, everybody works that way. . . ." (pp. 161-62).

A later segment of the Draft Final Report makes it clear that the pilots reasonably understood the flight level clearance as a clearance to destination:

> Another factor to be considered: in the uses and customs involving the phraseology and jargons commonly used in two-way radio communications within the Brazilian airspace, it is not unusual that, when referring to a certain stage of flight, with many changes in the vertical or horizontal navigation, the personnel involved – ATS units and flight crews – describe those changes in generic terms, normally mentioning the final destination and the first flight level – with each party assuming that the other is aware of the details . . .
>
> As for the flight of N600XL, it can be said that the flight plan was cleared with no clearance limits regarding the flight levels proposed. However, this was not made verbally clear to the crew of N600XL, whose first segment of the clearance (flight level 370 up to BRS) did not specify that, in fact, the plan had been cleared as filed. (p. 209).

If it is indeed common custom by Brazilian Air Traffic Control to give a partial clearance as if complete, and "assume" it is understood as partial, that custom is not only counterintuitive, but dangerous.

The Legacy entered sector 7 (BRS VOR) with the following transmission and acknowledgment:

> N600XL: BRASILIA, NOVEMBER SIX HUNDRED X-RAY LIMA, LEVEL . . . FLIGHT LEVEL THREE SEVEN ZERO, GOOD AFTERNOON.
>
> ACC BS: NOVEMBER SIX ZERO ZERO X-RAY LIMA, SQUAWK IDENT, RADAR SURVEILLANCE.
>
> N600XL: ROGER. (p. 45).

The Draft Final Report accurately characterizes the pilots' maintenance of Flight Level 370 as proper:

> As it was a category A controlled airspace, under RVSM conditions, it was not compulsory for the pilots to report that fix and, if one considers the pilots' situational awareness, they were authorized to

> maintain FL370 and, if necessary, they would receive a new clearance from the ACC.
>
> After the aircraft passed over the vertical of the BRS VOR, the actions required for the handover between the sectors were responsibility of the ACC BS.
>
> It is important to highlight that the maintenance of the FL370 on the part of the N600XL pilots was in accordance with the last instructions received from the ACC BS.
>
> During the seven minutes after the aircraft passed the vertical of the BRS VOR, the actions required were mainly the responsibility of ACC BS. (pp. 219-20).

The Draft Final Report also accurately describes the failings of the Air Traffic Controllers from this point onward:

> N600XL climbed according to the instructions received, and reported reaching FL370 on airway UW2, at 18:33 UTC.
>
> The last information received by the N600XL crew by means of a two-way radio contact was at 18:51 UTC, when they were informed that they were under Radar Surveillance (Radar Monitoring), according to what is prescribed in item 14.11 of ICA 100-12/2006.
>
> This condition was confirmed only after the aircraft squawked IDENT, transponder code 4574 assigned by ACC BS, in compliance with item 14.11.2, letter a, ICA 100-12/2006.
>
> In such a situation, it is the responsibility of the ATCO to issue instructions to the flight crew concerning a level change, since the crew will not make any level changes, unless authorized by the ATC.
>
> Besides, according to item 14.19.1, letter a (14.19 “Position Information”), within RVSM airspace, the pilot neither reports passing at fixes along the route, neither makes a level change, unless instructed to do so.
>
> The control unit providing RADAR SURVEILLANCE took no action to interfere with the vertical navigation of N600XL when the aircraft passed the vertical of BRS VOR, at 18:55 UTC, and proceeded with a new heading, now at a wrong flight level, joining airway UZ6.

> The information transmitted by the transponder was correct and available on the ATCO's screen, and so remained until 19:02 UTC, when the N600XL transponder stopped transmitting altitude information to the radars of ACC BS.
>
> From that moment on, the Legacy transponder no longer transmitted any information until approximately 58 minutes later.
>
> In such a situation, the maintenance of vertical separation in accordance with RVSM parameters would no longer be possible, and an action to be taken by the Air Traffic Control would be imperative, but that did not happen.
>
> On the screen of his console, the ATCO had every indication that the information of the transponder was not being received. The pilots, on the other hand, despite being within RVSM airspace, did not notice that the transponder was not transmitting altitude information anymore.
>
> The N600XL pilots, having not received any new instruction, maintained FL370, which was incorrect for airway UZ6.
>
> The controllers at ACC BS assumed that the aircraft was maintaining FL360, although they were not receiving information from the N600XL transponder, and without confirming directly with the aircraft, by means of a radio contact. (pp. 36-37).

FL370, of course, was the clearance that was given by ATC, and therefore not "incorrect" from the pilots' perspective and only "incorrect" because of circumstances created by, and known only to, Air Traffic Control. This staggering cacophony of failures in perception, errors in judgment, failures to take action, and violations of regulations and procedures is the key to the accident. As noted in the Draft Final Report:

> In the period the controller 1 of sectors 07, 08 and 09 was controlling the N600XL, the following facts occurred:
>
> • The aircraft passed the vertical of BRS VOR at 18:55:48 UTC, as shown at the rerun; it did not request a level change, "differently from what would be expected", and maintained flight level 370, while the flight plan indicated FL360. As confirmed at the rerun, this situation lasted from 18:55:48 UTC to 19:02:08 UTC, therefore, for about seven minutes. During this period, the N600XL data block on the controller's screen showed 370=360 (indicating that the aircraft had to change level at the point, according the active flight plan).

> • The aircraft lost the SSR contact (according to the rerun, at 19:02:08 UTC; according to the recording presented during the visit, at 19:01:38 UTC, as reported in the RICEA 16.01). The aircraft icon no longer had the circle, and displayed only the symbol "+", while the symbol "=" in the data block was replaced by the letter Z: 370Z360. Later on, the aircraft altitude began to present variations.
>
> • The service was taken over by controller 2 of sectors 07, 08 and 09, at 19:18:38 UTC (according to the RICEA, at 19:15 UTC), with the data block relative to the N600XL showing 385Z360.
>
> So, as observed, the controller 1 of sectors 7, 8 e [sic] 9 failed to call N600XL, when the aircraft had to be changing level; failed to ask for a frequency change from 125.05, sector 09, to an adequate frequency of sector 07; and, supposedly, he did not perceive the loss of the mode C, failing to execute the procedures prescribed in ICA 100-12 (items 14.2, 14.6 and 14.11), besides handing over the aircraft to the controller of sector 07, 08 and 09, with inaccurate information. (pp. 167-68).

Although the Draft Final Report's description of the failings of ATCO 1 of sectors 7-9 is understated, it gets the point across that this individual's failures in perception, judgment, and action truly were unreasonable:

> The controller's failure to act could only be caused either by a lack of perception or by a mistaken perception which does not find reasons for acting or reacting in that way.
>
> There were only five more aircraft in the sector, a fact that does not point toward a lack of perception caused by stress, on account of excessive workload.
>
> The failing to act, on the part of the controller, leads us, then, to the possibility of a lack of conditioning to react correctly to the pieces of information presented by the pieces of equipment. (p. 219).

Beyond the failings of individual Air Traffic Controllers, the Draft Final Report identifies systemic problems that contributed to this accident. In addition to those previously discussed, the system apparently changes the data strip to be consistent with the written flight plan, rather than with the actual clearances by Air Traffic Control that override the flight plan (see p. 171). Whether customary or not, this practice is obviously dangerous.

Both aircraft were put at FL370 and maintained the clearances they were given, a significant Contributing Factor that deserves more analysis than the cursory paragraph on p. 277.

ATCO Awareness of the Failure of Transponder Transmission

The Air Traffic Controllers' failure to perceive that, according to their screens, the Legacy's transponder was obviously not transmitting, was unreasonable:

> The aircraft lost the SSR contact (according to the rerun, at 19:02:08 UTC; according to the recording presented during the visit, at 19:01:38 UTC, as reported in the RICEA 16.01). The aircraft icon no longer had the circle, and displayed only the symbol "+", while the symbol "=" in the data block was replaced by the letter Z: 370Z360. Later on, the aircraft altitude began to present variations. The service was taken over by controller 2 of sectors 07, 08 and 09, at 19:18:38 UTC (according to the RICEA, at 19:15 UTC), with the data block relative to the N600XL showing 385Z360 . . .The data block confronted the FL 370 in the NIV field, with the CFL FL 360, by means of the equality signal of the T field, for seven minutes, during the time the aircraft mode C was being received. When mode C was lost, the NIV field started showing the variable altitudes which ended up stabilizing around values next to 360 (although the letter Z in the T field of the data block was clearly warning that the information was coming from 3D radar, requiring immediate actions from the controller. (pp. 168, 230-31).

Under the circumstances, ATC's failure to react to this obvious indication, to communicate, and to make a change in RVSM was a clear violation of ICAO regs:

> As seen in the picture, the white data block pertaining to N600XL displays a letter Z between the two levels earlier identified as NIV and CFL, according to the ATECH Controller's Manual already mentioned, meaning aircraft with a valid 3D altitude. This meant that, from that moment on, the altitude information relative to that aircraft was being obtained by 3D primary radar equipment and not from the transponder mode C any longer. . . .
>
> In this case, at the moment, the air traffic controller had an indication, according to the manual, that the detection of the aircraft was being obtained by primary radar, and that the source of altitude information was then the 3D radar, and not the C mode of the aircraft transponder, via secondary radar.
>
> The 3D radar does not have ICAO approved documentation for use in vertical separation of traffic.

> Brazil does not use 3D radars for purposes of vertical separation of traffic, although they are normally used in an air defense environment.
>
> The ATC system uses Primary and Secondary radars, according to the ICAO rules. These rules say that RVSM airspace requires a secondary radar plus an operative transponder, with C or S modes. (p. 226).

The cascading errors committed by ATCO 2 of sectors 7-9 not only violated ICAO regulations, but were compounded by the fact that the aircraft was entering an area without radar coverage:

> The controller 2 of sectors 7, 8 and 9, being aware of the loss of the transponder and, later, of the primary radar contact loss with N600XL, attempted to contact the aircraft, but did not perform the procedures prescribed by ICA 100-12 for transponder and radar contact loss (items 14.2.1, 14.4.9, 14.4.10, 14.4.11, 14.6.3 and 14.6.4) and maintained the N600XL under RVSM. It can be observed that when he had difficulty contacting the aircraft, he did not perform the procedures prescribed in ICA 100-12 (items 4.1.2, 7.14.1, 7.14.2 e 7.14.6). (p. 170).

The Draft Final Report admits, as it must, that the theory of the pilots' "neglect" of indicators of transponder transmission failure is just that, a hypothesis and not a fact:

> The fact is that the discontinuance of the transponder transmission contributed to the accident, and the reason for that remains in the field of hypothesis; since the pilots affirm that they did not do anything to change the transponder operation mode, besides not having perceived any indication in the aircraft systems that the transponder was not transmitting. (p. 259).

The hypothesis of pilot "neglect," such as it is, runs counter to the pilots' interviews. A theory "that remains in the field of hypothesis" has no place in a Final Report. To blame the pilots for the transponder failure, in the face of incomplete and inadequate transponder testing, is inappropriate accident investigation methodology that does nothing to prevent the occurrence of similar accidents in the future.

A few final observations. Air Traffic Control has the responsibility, and is in the superior position, to monitor the proper functioning of the transponder in IFR airspace. Flight crews rely upon them to do so. In this instance, the pilots had no reason to believe that their flight had been affected by a spiraling series of errors by Air Traffic Control related to altitude assignment, frequency assignments, and monitoring of the flight. Beyond that, CENIPA and the FAA have

issued recommendations related to the inadequacy of cockpit indications of a failure in transponder transmission, when such a failure is in fact reflected.

The two paragraph discussion on pp. 278-79 does not adequately address the significant role of this Contributing Factor in the happening of the accident.

Communication and Frequency Problems

Beyond Air Traffic Control's failings in relation to clearance, monitoring, and separation, Air Traffic Control also failed to facilitate communication with the Legacy by a string of errors related to frequency assignments and communication:

> The programmed N600XL flight level change from FL370 to FL 360 would normally occur within sector 5. However, the controller of sector 7 was not advised and the aircraft did not receive any clearance limit.
>
> The controllers did not provide N600XL with the prescribed frequency 135.9 MHz, so that the aircraft could communicate when entering sector 07.
>
> The air traffic controllers did not comply with the RVSM traffic separation standard procedures when they allowed N600XL to fly at a wrong flight level, after the aircraft passed the vertical of Brasilia, even having received information coming from the screens that the active flight plan had a programmed flight level change overhead Brasilia VOR.
>
> They did not perform the procedures prescribed to contact the aircraft when the transponder signal transmission ceased, a contact which was mandatory for the maintenance of the aircraft under RVSM vertical separation parameters. An action by the pilots would also be pertinent, relative to the discontinuance of the transponder transmission.
>
> The air traffic controllers at console 08 did not select the appropriate frequencies prescribed in the chart for that sector. That was the reason why the calls made by N600XL on two of the frequencies listed in the chart for sector 07, despite being received and registered in the audio center of Brasilia ACC, never arrived at the control console.
>
> The frequency 128.0 MHz, although selected on the console and installed in the operation site, still lacked enlacement with the audio

> center of CINDACTA I, resulting that no register of communication on that frequency was made.
>
> Three out of the five frequencies listed in the pilots' charts were not available on account of procedure and resource management errors.
>
> Thus, of the five frequencies for sector 07 listed in the pilots' Jeppesen chart, only 135.9 MHz was operational, since the fifth frequency, 134.7 MHz, was not correct as it was not prescribed in the Brazilian chart. (pp. 269-70).

To an extent, these frequency problems are systemic to this sector in Brazil:

> The ACC BS, responsible for the FIR-SBBS, has communication sites equipped with VHF-AM ParkAir systems.
>
> In relation to the FIR-SBBS aeronautical mobile service, the investigation observed that:
>
> a) The frequency 128.000 MHz was not operational;
>
> b) The frequencies 123.300 e 133.050 MHz were not operational;
>
> c) The frequency 134.700 MHz of the chart published by Jeppesen was incorrect; and
>
> d) The frequency 121.500 MHz was not operational. (pp. 38-39).

These communication problems are compounded by systemic problems in Brazil related to areas without radar coverage, what the Air Traffic Controllers referred to in their initial interviews with the Federal Police as notorious "black holes" in coverage:

> It can be verified that the aircraft was not on the screen for almost four minutes and during this period, the controller did not take any action. The ICA 100-12, in item 14.6.3, establishes that: "the controller shall advise the pilot, whenever the radar contact is lost." (p. 176).

The pilots, while en route, were under radar surveillance, maintained a listening watch, and heard ongoing bilateral transmissions between flight crews and Air Traffic Control. They had no reason to know that they had been given frequencies that did not work or were not properly programmed. They also had no reason to know that they had been placed in a dangerous situation by a slew of irrational errors committed by the Air Traffic Controllers. Air Traffic Control had reason to know these things. The pilots neither behaved unreasonably, nor committed violations of any regulations, in their efforts to communicate.

CLARIFICATION

The Draft Final Report omits any discussion of avionics issues as a Contributing Factor and improperly focuses on the actions of ExcelAire itself as somehow being a Contributing Factor. The former should be included and the latter taken out of Section 5 of the Report. Similarly, the Draft Final Report glosses over the lack of situational awareness by the Air Traffic Controllers and magnifies perceived errors on the part of the crew of N600XL, without any factual foundation therefor.

Avionics Testing and Detected Failures

The Draft Final Report merely theorizes and hypothesizes that the pilots had, and neglected, an indication that the transponder had failed. There are a variety of alternative mechanical reasons that could have caused the transponder's transmission to have not been received, including the following:

The RMU had failed on two other aircraft before it was installed on N600XL.

The RCZ which includes the transponder module was rejected from one other aircraft before it was installed in N600XL.

The flight management system failed twice during production flights due to faulty connectors just two days prior to the accident.

There was a fault logged in during the accident flight, that was revealed in the course of a download of faults during testing at Honeywell. While the aircraft was cruising at flight level three seven zero, the TCAS "weight on wheels" signal went on, reflecting the equipment's "belief" that the aircraft was on the ground; the TCAS system will not function when the aircraft "believes" that the aircraft is on the ground.

The equipment was not properly tested with the excessive silicon that had in fact been present on the antenna and antenna cable; that silicon could have significantly degraded the working units signal.

The unit was reported to have failed during its initial bench test at Honeywell.

The testing completely failed to check the "weight on wheels" switch. (See pp. 21, 26, 28, 32, 33).

None of these possibilities have been sufficiently explored or tested. The Report's assertions that there were no abnormalities logged is inaccurate and blatantly ignores the various problems that were noted during the acceptance flights.

The Report's hypothesis that the pilots negligently failed to notice a permanently exposed "TCAS off" warning on their screens is theory only. There is no factual data that clearly supports what is nothing more than a hypothesis. There is an absence of any reliable evidence of such warnings. The most reasonable interpretation of the CVR transcripts is that these warnings did ***not*** occur.

At 19:59:13 Jan Paladino asked Joe Lepore, "Dude, you have the TCAS on?" This question, which is posed by Paladino soon after the impact, reveals that there was no "TCAS off" indication on the screens right in front of him, and so he is asking Lepore to check his screens as well. Lepore's first word in response to the question ". . . you have the TCAS on?" is "yes". His initial response reveals that his review of the screens indicated that the equipment was on. He then adds the words "TCAS is off." This logically indicates that, although the equipment was on, Lepore saw no visual indication from the TCAS reflecting a collision. Equally noteworthy that neither Paladino nor Lepore expressed any verbal reaction, strong or otherwise, consistent with the supposed alarming news that the TCAS system was turned off, as the Draft Final Report accuses. The dialogue is completely consistent with Paladino's reaction at 19:59:53, "so much for TCAS," which reflects that, although the TCAS was on, it did not function as it was supposed to.

The remarks by Lepore and Paladino demonstrate that there was not a "TCAS OFF" indication on the screens in the cockpit. The TCAS system simply did not work properly.

The Draft Final Report surmises that one of the pilots switched the transponder on after the impact. A logical explanation for ATC's resumed receipt of transponder return after the impact relates to the position where the radar signal disappeared for the GOL aircraft heading south and reappeared for the Legacy heading north. South of that specific point, at which the GOL disappears and the Legacy reappears, would best be described as an area of radar coverage deficiency, a "black hole."

Any theory that the pilots turned off any equipment is rank speculation. The CVR captures what the pilots said. The pilots were interviewed extensively about what they said. There is no audible sound or other indication on the CVR itself that corresponds to any equipment being turned on or off nor does the Draft Final Report point to any such sound or a sound spectrum analysis of the CVR that would indicate that inadvertent entry resulted in loss of functionality of either the TCAS or the transponder.

Based on the above, the Report's theory cannot be credited as authoritative and does not warrant inclusion as a Contributing Factor, particularly in light of the failure to test for, and rule in or out, the various mechanical abnormalities outlined above. In light of the incomplete avionics testing, Section 5.2.2 Material Factor, likewise should not state "not a contributor," but should, at a minimum, outline the unsettled and outstanding avionics issues.

Company Operations and Supervision

The Draft Factual Report makes a number of criticisms of ExcelAire, which it asserts were Contributing Factors as to performance, training, and supervision:

> The performance deficiencies shown by the crew have a direct relationship with the organizational decisions and processes adopted by ExcelAire: the inadequate designation of the pilots for the operation; the insufficient training for the conduction of the mission, and the routine procedures relative to the planning of the flight, in which there was not full participation of the crew. (p. 277).
>
> There was not perception by the Directorship of the operator to choose other alternatives, besides the one adopted. They should not have allowed that crewmembers who hardly knew each other, and that had never flown as PIC and SIC of the same crew, except in the simulator, conducted their first mission in "International Operation", mainly to receive a new airplane about which they did not have adequate knowledge. (p. 283)
>
> The process of pilots' selection for the composition of the operator's board of pilots, mainly the hiring of the SIC, was not a contributing factor for the accident. However, the probable expectation of the operator was that the crew would reach technical and operational proficiency in the equipment, considering the general experience of the pilots (ATP), and, for that reason, the human resource and time managements were contributors to the accident. (pp. 283-84).
>
> There was inadequate supervision by the Directorship of the operator, resulting in an inappropriate planning of the delivery and removal operation of the new airplane. If a more efficient planning had been made, the problems that occurred could have been corrected in advance. (p. 284)
>
> All of this was considered a chain of errors, without violations on the part of the operator. (p. 284).

The Draft Final Report is breathtakingly inconsistent in its characterization of events. On the one hand, it states that the pilots possessed the necessary qualifications and experience for the flight (pp. 20, 73, 199) and, on the other hand, states that the pilots did not have enough experience for the flight (p. 84). On the one hand, the Draft Final Report criticizes ExcelAire for a lack of "systematized and standardized procedures (SOP) that might have heed the pilots to comply with the numerous tasks of the mission, since the pilots remained a very short time in Brazil" (p. 80), yet at the same time criticizes the pilots and ExcelAire for purportedly not following SOPs (p. 227). The Draft Final Report acknowledges that the flight was a Part 91 flight yet suggests assorted Part 135 violations. What it suggests are violations of Part 135 did not violate the regulations at all, and none of these supposed transgressions have any bearing on this accident.

ExcelAire Service, Inc. is certified as an air carrier pursuant to Part 135 of the Federal Aviation Regulations, 14 C.F.R. pt. 135. While the flight on September 29, 2006 was a Part 91 flight, and not a Part 135 flight, ExcelAire's Part 135 operations are subject to rigorous oversight by the FAA.

In the year immediately preceding the accident, ExcelAire flew to 46 different countries around the world, including Aruba, Australia, Botswana, Brazil, China, Costa Rica, Croatia, Mexico, Portugal, Russia, South Africa, Turkey, and the United Arab Emirates, among many others. Its operations personnel and pilots are trained and experienced in international air travel, which is a routine part of ExcelAire's business.

Both pilots hold Airline Transport Pilot ("ATP") certificates from the FAA. Before coming to ExcelAire, both flew for Part 121 air carriers. Jan Paladino had extensive experience flying to Central and South America. Both pilots completed extensive factory-authorized flight training at FlightSafety International, even though Jan Paladino already was type-rated in the EMB-145. FlightSafety is the world's largest provider of aviation services and, indeed, provides EMB-145 flight training services and conduct training for VARIG of Brazil.

The FlightSafety training consisted of 76 hours of ground training and 26 hours of flight training, including simulator time for each as both pilot-in-command and second-in-command. Before leaving for Brazil, both pilots flew together on a roundtrip flight from Fort Lauderdale to Kansas City, accompanied by Embraer pilots, with each flying a leg in another Legacy aircraft. At São José dos Campos, both flew N600XL on 3 separate acceptance flights, each taking a turn in the left seat, totaling approximately 4 flight hours.

The pilots had unblemished safety records. They were qualified and prepared to make the flight, and ExcelAire made sure they were given weeks of training in the type aircraft. Ex post facto finger-pointing has no place in an Annex 13 investigation and must be taken out of the Draft Final Report.

Situational Awareness and Irrelevancies and Misconceptions

The failures in situational awareness on the part of Air Traffic Control, as noted in the Draft Final Report, are obvious based on the errors they committed. These included a long string of errors in flight clearance, flight monitoring and separation, and communication (see, e.g., pp. 184-85; 268-69; 167-68).

To reiterate, the Draft Final Report was compelled to admit the basic and real competence of the pilots:

> There was a low situational awareness concerning the full application of the CRM doctrine, at the phase of planning and preparation for the flight, although the pilots of the N600XL had taken CRM courses.
>
> In other words . . . the pilots demonstrated to possess the profile of serious and responsible highly experienced professionals, who never deliberately neglected the prescribed procedures. Nonetheless, they did not realize that the procedures were short of what was required by the operational environment. (p. 199).

The Draft Final Report also was compelled to admit the pilots' possession of the necessary qualifications and experience to conduct this flight, as well as the adequacy of this training:

> The pilots clearly possessed the necessary qualifications and experience for the flight. . . .
>
> In other words, upon completion of the training at FSI, the two pilots were entitled to fly on domestic and international flights under the aegis of Part 91, without having interacted as a crew before. . . .
>
> Individually, the PIC and SIC had the requirements to conduct the mission: they were certified as ATP, had accumulated a great number of flight hours, were in good health, had already flown other types of equipment and were highly motivated.
>
> On an individual basis, each pilot had met all the requirements established in the selective process by the operator. (pp. 198, 265, 267).

Moreover, the Draft Final Report was compelled to admit that the pilots' conduct, including the handling of flight dispatch, was in no way contrary to regulations:

> A copy of the flight plan that had been filed was only handed to the pilots less than half an hour before departure.
>
> It is interesting to point out that this does not represent any abnormality or violation of procedures. . . .
>
> It is important to point out that the pertinent legislation does not set requirements for this type of operation, in terms of flight dispatch. (pp. 201, 198).

In fact, much of the Draft Final Report's criticism of the pilots and their situational awareness strays into misconceptions and irrelevancies in relation to the occurrence of this accident. Much of the criticism of the Legacy's flight crew relates to matters that do not violate regulations or play any role in the happening of the accident. The fact that the aircraft was exactly on course and that the

pilots landed a badly crippled airplane directly contradicts any suggestion that the pilots were either situationally unaware, or in any way deficient in their knowledge or proficiency with this airplane.

For example, the Draft Final Report criticizes the PIC for supposedly lacking knowledge of the operation of the aircraft's systems (p. 75). This observation completely lacks any factual support. Furthermore, the extensive interviews of the PIC and SIC the investigators did not even test on this issue. And, as noted above, various other portions of the Report acknowledge the qualifications and competency of the flight crew.

Similarly, the Report criticizes the dearth of instrument checks, on the basis that the CVR does not reflect the same and therefore, "apparently," they did not occur (pp. 78, 92). This assumption (and that is all that the word "apparently" reflects) is illogical and unsupported. Visual scanning of instruments would not ordinarily produce verbal comments that would be reflected on a CVR. In any event, the CVR reflects the attention of the crew to frequencies and systems.

Along the same vein, the Report mischaracterizes the PIC as having an "incapacity to fly" after the collision. There is no basis for this observation. The SIC, who changed positions with the PIC thereafter, had over 300 hours of experience in a similar aircraft. Their division of labor was reasonable under the circumstances, and the aircraft was landed safely. The criticism that the PIC and SIC had never previously flown together (p. 74) is of a similar nature. This neither violates any regulation nor is in any way relevant to the occurrence of the accident.

Finally, the Report's transcriptions of several sections of the CVR, to support strained arguments against the pilots' competence, are simply inaccurate. As example of this occurs on page 115 of the Report, in relation to 18:51:20 – 18:51:26 of the CVR. A review of the CVR reveals that the SIC says, "I forgot to do that," not "I forgot how to do that." The PIC responds, "ID'd right there," not "ID is there." The passage relates to momentary forgetfulness, followed by acknowledgment, and not lack of understanding of the aircraft's systems. This is just one example of several transcription errors, which are discussed more fully in the Details section.

On the other hand, the well-documented, abysmal performance by Air Traffic Control in causing this accident bespeaks a complete failure in situational awareness. It also bespeaks a failure in competency and qualifications in training, as revealed by the sadly prophetic testing results of ATCO 1 of sector 7-9:

> The controller completed the training for the radar control certification at CINDACTA I. Eight Operator Evaluation sheets referring to the period between July 7 and August 31, 2004, were presented, two of them with an "INAPT" result. The difficulties presented referred to: secondary radar identification methods, establishment of priorities, guidance as to the need of taking notes on the electronic strips, poor emotional control, voice intonation and little agility in the "instructions." (p. 137).

The result of that testing, not very long afterward, was as follows:

> The ATCO 1 of sectors 7, 8 and 9 of ACC BS did not make a radio contact with N600XL to change the aircraft flight level and to switch the frequency from sector 9 to sector 7; he did not perceive the N600XL loss of mode C; he made an error of judgment, by assuming that the N600XL was at flight level FL360; he did not perform the procedures prescribed for the loss of transponder in RVSM airspace; and for the control position relief, by both omitting information and transmitting incorrect information. (p. 278).

In IFR airspace, Air Traffic Control had the function and duty to create separation between aircraft. Instead, Air Traffic Control, through a series of major, unreasonable errors in perception, judgment, and action, placed and maintained two competent crews on a collision course.

DETAILS

Page-by-page and line-by-line comments and corrections are attached.

CONCLUSION

ExcelAire respectfully requests that its comments be taken into account, and does not object, pursuant to 49 U.S.C. § 1114(b)(3), Protection of Voluntary Submission of Information, to public disclosure of this letter.

Sincerely,

Robert M. Sherry
President/Chief Executive Officer

Attachment