



# INTERNATIONAL FEDERATION OF AIR TRAFFIC CONTROLLERS' ASSOCIATIONS

1255 University Street, Suite 408, Montreal (Quebec) H3B 3B6 CANADA  
Tel: +1 514 866 7040, Fax: +1 514 866 7612, Email: office@ifatca.org

12 January 2009

---

## POSITION STATEMENT

---

### BRAZIL: A MISSED OPPORTUNITY

The final accident report of the mid-air collision in Brazil involving flight GOL 1907 and N600XL which occurred on September 29, 2006 at **FL 370** was published on 10 December 2008 by the Brazilian aviation accident investigation bureau CENIPA (Centro de Investigação e Prevenção de Acidentes Aeronáuticos).

IFATCA notes that whereas the inquiries in regards to the events in the cockpit of the Legacy private jet seem to have received a lot of attention and were done with rather detailed care by CENIPA, the same cannot be said for investigations on the ATC-side. The Federation notes with disappointment that the well-evidenced failures and safety problems of the Brazilian ATC-system, including its contributions to the fatal chain of events of the accident, have not received the required attention and detailed scrutiny from CENIPA. This is disappointing as in the aviation community there was hope that the final accident report would shed a neutral light on the problems and shortcomings of the Brazilian ATM-system, in particular on these elements that were part of the chain of events leading to the mid-air collision of 2006.

The final accident report admittedly focuses on some events and problems on the ATC-side, but these items do not lead to clear conclusions. They also do not lead to the issuance of safety recommendations as a logical consequence. Rather, the "Analysis of the Surveillance" section, starting on page 253 of the report, ends on page 255 with the following paragraph:

*"The pieces of equipment involved in the scenario of the occurrence did not present design failures, since they functioned within their specifications on the day of the accident, removing the possibility of a contribution of the Communication and Surveillance Systems and Equipment."*

IFATCA's Human Factor Specialist, Bert Ruitenbergh, co-author with Dr. Anne Isaac of the book that was cited several times in the final accident report of CENIPA, says *"However the mere fact that equipment 'functions within its specifications' doesn't mean the specifications were well-designed! In order to identify design failures, the content of the specifications needs to be looked at - not how a system functions relative to its specifications"*

On 24 November 2006, two months after the accident occurred, IFATCA included the following statements in our press release:

"IFATCA has been very much surprised by what was seen when visiting the ACC [Area Control Centre] in Brasilia after the accident in early October 2006. The cleared flight level ("nivel autorizado") on the aircraft label, as it appeared on the radar screen, was not only fed by controllers into the system (once the clearance was transmitted by radio to the aircraft, and the aircraft had correctly read back the clearance), but there were occasions when this was done automatically by the system itself without any direct input from the controllers. This automatic change did not show prominently on the aircraft label as it should (both the *fonts* and the *colours* of the label remained the same as before). The "explanation" given by the [Brazilian] authorities was that this FL was actually the Flight Plan Level of the flight and so it was "normal" to change it automatically when an aircraft passes over a fix (or [navigation]-aid) where a change of flight level is requested by the flight plan."

"In many ACCs of the world, this crucial information of the cleared flight level ("nivel autorizado") is fed by the controllers into the system once the clearance is transmitted by radio to the aircraft (and this has been correctly repeated by the pilot = read-back). This "feeding of the system" is sometimes done by hand-writing on paper strips, while other systems work electronically whereby the input is done directly onto the label of the flight that appears on the radar screen at the CWP (Controller Working Position). What is very important, even crucial, is that the ground ATC system and the aircraft cockpit always dispose of the same information."

"IFATCA believes that operators in the air (the pilots), and on ground (the controllers), fell victim to unacceptable systems traps brought on by 'non-error tolerant', and 'bad system design' of air traffic control and flight equipment in use. We are confident that our statements concerning this equipment are accurate, and said equipment is responsible for starting the fatal chain of events of September 29, 2006, and therefore, contributed to the mid-air collision."

The automatic level changes by the ATC software are mentioned, investigated and explained to a certain degree in the report, and the CENIPA considerations clearly hint to several safety issues related to this tool, yet CENIPA does not issue any safety recommendation for this controversial feature. This is surprising, as it is a known fact that the United States' National Transportation Safety Board (NTSB) had already in 2006 issued a safety recommendation related to this same system and in particular the automatic level changes.

In accordance with international standards, the NTSB in 2008 was given the opportunity to comment on the final report by CENIPA before its publication, and the comment is included in the report as Appendix 2. The NTSB *inter alia* states the following:

"[...] the use of the automatic "cleared altitude" field change has the potential to mislead controllers, is a poor human factors design, and is a clear finding of risk. In fact, this event was one of the first that is **directly** tied to the accident scenario. This feature has the undesirable effect of making the ATC automation "lead" the actual clearance issued to the flight crew. A basic tenet of ATC is to have a double check of clearances. The automatic change takes away a method for the [controller] to reinforce the proper clearance in his mind. If the controller makes the entry, the action of keying in the numbers helps to confirm that he has issued the correct altitude and that the pilot has read back the clearance correctly. Therefore, the automatic change of the datablock field from "cleared altitude" to "requested altitude" without any indication to, or action by, the [controllers] led to the misunderstanding by the sector 7 controller about what altitude clearance was issued to N600XL. **[Conclusion]**"

"We recommend modifying the software to make it clear to controllers whether this field of the datablock is displaying a requested altitude or a cleared altitude. At the least, a "reminder" feature should be distinguishable from a display that reflects the actual clearance status of the aircraft. This feature has been discussed in worldwide ATC publications, and the report must address the issue completely. A detailed assessment of this feature should be conducted, and, if the feature is not changed, the assessment should completely demonstrate why retaining the feature is desirable. Such an assessment must specifically show training and procedures that fit with the feature and support correct issuance of clearances in accordance with ICAO document 4444. **[Recommendation]**"

These and other statements from the NTSB 2008 comment in the CENIPA report confirm the statements made by IFATCA in our November 2006 Press Release. What is more, they say with so many words that "poor human factors design" is applicable to a key aspect of the ATC system in Brazil, i.e. the display of flight information to controllers in the data label on their radar screens. "[...] A design in which two distinctly different pieces of information (that is, requested altitude and cleared altitude) appear identical on the display is clearly a latent error", according to the NTSB comment.

IFATCA notes that in late 2008 CENIPA have issued a new Safety Recommendation that requires the installation of the CLAM-tool (Cleared Level Adherence Monitoring tool) for all en-route control centres of Brazil. Whilst IFATCA supports the installation of a CLAM tool, it must be noted that CLAM is a "safety net" to alert controllers of a possible problem. It is not a solution for the inherent design flaw of the operating system that allows the displayed level to be changed without knowledge and input from the controllers.

In conclusion, IFATCA thinks the identified shortcomings in the CENIPA report are a missed opportunity for the Brazilian aviation authorities to restore trust and safety in the

national aviation system. This final accident report could have served as the starting point for an extensive and desperately needed healing process, the trigger event to reorganize and restructure the national ATC-system that received a lot of criticism and of which the safety is openly questioned. This has unfortunately not occurred, as CENIPA (an integral part of the same Brazilian Air Force that is responsible for the provision of air traffic control) has chosen to put the main responsibility for the mid-air collision of 2006 on the frontline operators only. This CENIPA decision appears driven by a reluctance to expose staff and departments situated in its own organization.

IFATCA has noted with satisfaction the dissenting opinion expressed by the NSTB. The Federation notes that the NTSB comes to very similar conclusions in regards to the Brazilian ATC-system, and the points and features that have played a role in the mid-air collision of September 2006. IFATCA agrees with the NTSB that these problems and issues still continue to exist, and that they mostly likely will not be addressed and fixed by the clean-up process initiated by the Brazilian authorities,. Even after the CENIPA accident report the deeply rooted structural and organizational problems and - issues of the Brazilian ATM-system continue to exist. Indeed a missed opportunity, yet hopefully not a lost opportunity: after all, safety improvements can also be made without the guidance of a CENIPA recommendation!

**IFATCA is the worldwide organization representing more than fifty thousand air traffic controllers in over 130 countries. Amongst its goals are the promotion of safety, efficiency and regularity in international air navigation and the protection and safeguarding of the interests of the air traffic control profession.**

**[www.ifatca.org](http://www.ifatca.org)**