



**Agenda  
Item 7:**

**Other Business**

**MID-AIR ACCIDENT BETWEEN PR-GTD AND N600XL AIRCRAFT**

(Presented by Brazil)

**Summary**

This information paper aims at presenting the actions taken by the Brazilian administration after the Midair Accident between the PR-GTD and N600XL aircraft.

**References**

- Preliminary Report on the Investigation of the Midair Accident between the PR-GTD and N800XL aircraft.
- First Safety Recommendations

**1. Introduction**

1.1 It is of common knowledge, mainly of those people connected to air navigation, that a terrible and regrettable mid-air collision between the PR-GTD and N600XL aircraft has taken place within the Amazonic FIR.

1.2 Since from the accident up to this moment, the Brazilian administration is running an exhaustive investigation, according to the contents of the Annex 13, aiming, mainly, at implementing the necessary actions to prevent that accidents of such nature come to happen again within the Brazilian airspace, as well as to contribute to prevent them in any airspace.

1.3 By the time this information paper was being produced, the Aviation Accident Investigation and Prevention Center (CENIPA) has published an investigation preliminary report on that accident and the first safety recommendations, which have been taken into consideration in this paper.

## **2. The mid-air accident between the PR-GTD and N600XL aircraft**

2.1 The flight plan submitted by the N600XL aircraft, leaving São José dos Campos to Manaus, has requested the flight level 370 up to the Brasilia VOR (BRS), the flight level 360 between BRS and the notification point TERES and the flight level 380 between TERES and Manaus. The N600XL has taken off at 14:51h (Brasilia time) and at 15:33h reached the flight level 370, according to the flight plan presented for the first leg up to VOR BRS. That flight level was kept up to the time of the collision. The flight GOL 1907, performed by the PR-GTD aircraft, leaving from Manaus, has requested the flight level 370 from Manaus to Brasilia. It has taken off at 15:35h and reached the flight level 370 at 15:58h, in route UZ6, conditions that were maintained up to the time of the collision.

2.2 At 15:51h it took place the last bilateral contact between the N600XL and the Brasilia ACC (Frec. 125.05 MHz). At 15:55h, the N600XL crossed the Brasilia VOR, keeping the flight level 370, and entered the route ATS UZ6 without requesting or receiving any instruction of the ACC Brasilia. At 16:02h, the information exchanged between the secondary radar and the N600XL was lost. At 16:56:54h, the collision happened.

## **3. General Considerations**

3.1 There are no records of requests coming from the N600XL to the ATC facilities with the objective of making flight level alterations, right after reaching the flight level 370, so, as there are no records of any instruction from the ATC facilities, in order to allow such changes, after the last successful bilateral contact between the N600XL and the ACC Brasilia.

3.2 The TCAS system existing in both aircraft did not transmit any traffic advisory (TA) or resolution advisory (RA). At the same way, no reaction was shown by any of the crews regarding a visual perception of the aircraft approximation.

3.3 At 16:56:54h there was a collision, probably, between the left wing of the N600XL and the left wing of the flight 1907. The GOL 1907, right after the collision, got uncontrollable, starting its way down to the ground.

3.4 At 16:59:50h, approximately three minutes after the collision, the Amazonic ACC started receiving the information from the secondary radar with accurate altimetry and the transponder code allocated to the N600XL. At 17:00:30h, the Amazonic ACC made a call to the N600XL and received no answer. At 17:01:22h the N600XL tried to establish communication with the Amazonic ACC, through the flight Polar 71, requesting coordination to land on the Novo Progresso/Cachimbo Aerodrome – SBCC.

## **4. Actions Taken**

4.1 Recovering of the N600XL and the PR-GTD's flight data recorders;

4.2 Obtaining of all data registered by the Air Traffic Control concerning the accident.

4.3 Verification of the B737-800 debris at the accident spot.

4.4 Reading and processing the data recorded in the flight and voice recorders, of both aircraft, at the TSB Ottawa, Canada.

4.5 Preliminary analysis of the records and transcription obtained from the communications between the aircraft and the ATC facilities.

- 4.6 Verification of the equipment retrieved from the PR-GTD debris.
- 4.7 Verification of the data related to the radar visualization, recorded at the ATS (Amazonic and Brasilia ACC) facilities.
- 4.8 Publication of the First Safety Recommendations.
- 4.9 Analysis of the radio and navigation equipment, transponder and TCAS of the aircraft, which will be performed in laboratory.
- 4.10 Works related to air traffic, that will be carried out in the United States, by invitation of the FAA, to analyze, among other subjects, the rules and prerequisites for American pilots flying abroad.
- 4.11 Functioning of the transponder and of the radio and navigation equipment of the N600XL aircraft;
- 4.11 Works and interviews with the aircraft operators.
- 4.12 Recollection of data, not yet concluded, on-going analysis in relation to:
  - a) Knowledge and training foreseen to N600XL pilots fly in Brazil.
  - b) Aspects related to the rules and procedures applicable to the Air Traffic Control, presently in use in Brazil and in the world.
  - c) Systems and Equipment of Air Traffic Control Communications and Surveillance.

## **5. First Safety Recommendations**

- 5.1 The Aviation Accident Prevention and Investigation Center has already broadcasted the first safety recommendations, aiming at starting the process of preventing new aviation accidents. The safety recommendations were evaluated by the Airspace Control Department (DECEA) and will be implemented.
- 5.2 Recommendation RVS (A) 260/A/06 - CENIPA - "Review the AIP BRASIL, aiming at its updating, with emphasis in the process of including Brazilian Air Traffic rules and procedures."
  - 5.2.1 The AIP-Brazil remains updated in relation to air traffic rules and procedures, according to what is established by the IACO. After the accident, the DECEA has identified the need of publishing an amendment to the AIP-Brazil, at the GEN 1-7, including the procedures in case of aero terrestrial communications failure, foreseen in the Brazilian rules, which will come into force on May 10th, 2007.
- 5.3 Recommendations RVS (A) 261/A/ 06 - CENIPA - "To instruct air traffic controllers on the accomplishment of air traffic authorizations that shall be transmitted to pilots".
  - 5.3.1 Although they are included in specific regulation and are object of regular courses and of operational maintenance, the DECEA has oriented all Air Traffic Facilities as to providing a course on air traffic authorizations rules and procedures, in a general and specific sense, for each ATS Facility.
- 5.4 Recommendation RVS (A) 262/A/06 - CENIPA - "To assure the proficiency level on the English language of all ATCOs, as well as to provide the necessary means to accomplish the indicated SARPS, as defined in the DOC 9835 and in the ANEXO 1 of the ICAO."

5.4.1 To accomplish the rules established by the ICAO, the DECEA has been investing in capacitating their air traffic controllers since 2004. To assess the necessary investments, in 2006 it has been carried out a diagnostic analysis of the air traffic controllers English level, based in a sampling of 73% of the whole universe of controllers engaged in the international air traffic. Taking into account the analysis mentioned above and with the objective of attending this international dates, the investments has suffered an exponential increase in 2006 and 2007. So, this safety recommendation shall be attended in March 5th, 2008 and implemented, exclusively, for the controllers of the ATS Facilities that have the obligation of communicating in English.

5.5 Recommendation RVS (A) 263 /A/06 - CENIPA - "To assure that the ATCOs fully accomplish all air traffic control transference procedures between the adjacent ATC Facilities and/or the operational sectors of the same Facility".

## 5. Short Term Actions

5.6 Recommendation RVS (A) 264 /A/06 - CENIPA - "To assure that the procedures foreseen for aero terrestrial communications failure be fully accomplished by the ATC Facilities".

5.6.1 The rules and procedures related to communications failures are established in the national regulation, with some alterations regarding to what is determined in the ICAO's documents. The specific procedures of each ATS Facility for the application these rules are included in the operational models of the ATS Facilities. The actions referred to the recommendation RVS (A) 261/A/06, included in item 5.3 of this information paper, will serve as a basis to attending this recommendation.

5.7 Recommendation RVS (A) 265 /A/06 - CENIPA - "To assure that all the ATCOs take part in the updating courses on air traffic rules, considering, in addition, the recommendations of topics 5.3, 5.5 and 5.6 of this information paper".

5.7.1 The instruction of air traffic controllers is led by DECEA's Regional Offices and the IFRAERO. In this context, operational tests and practical training with simulators, as well as operational updating courses at the Airspace Control Institute (ICEA), are provided in annual basis. However, taking into account this safety recommendation, a specific instruction plan, that encloses all aspects mentioned within topics 5.3, 5.5, 5.6 and 5.7, will be elaborated an aiming at providing the necessary operational updating courses.

5.8 Recommendation RVS (A) 266/A/06 - CENIPA - "To rule and make operational the utilization of the OFF SET lateral flight procedure".

5.8.1 The application of this procedure within the Brazilian continental airspace is not possible, taking into account what is foreseen in item 15.2.4 of the Doc. 4444 ATM/501. For the application of these procedures it would be necessary to carry out studies, which should consider the following aspects:

- In a route system with many crosses, the application of the Lateral OFFSET will make difficult the job of air traffic controllers, considering that such crosses would not occur in an exclusive spot, but in many "virtual spots";
- It would be required the review of the separation criteria between aircraft, taking into account the possible displacement of up to 2 NM between aircraft can affect the separation criteria in force;

- The possible application of values lower than 1 NM will need the evaluation of the automated capacity of the aircraft lateral "off set" and of the certainty that the application of such values would represent an adequate reduction in the risk of collision between aircraft;
- The application of the lateral OFFSET in an environment covered by radar, maintained the condition that the pilot doesn't need to request authorization to the controller, could provoke an undesirable approximation between aircraft, at the time the aircraft are crossing one by the other.
- The application of the lateral OFFSET with the air traffic controller authorization will cause an increase in the work load of the controller, generating, consequently, a reduction in the system capacity.

5.9 Recommendation RVS (A) 267/A/06 – CENIPA – “To implement a new presentation (alert effective system) of mode “C” loss of information on the radar consoles, in the software being used at the ATS Facilities, so as to improve the situational awareness of the ATCOs”.

5.9.1 This matter addresses the possibility of creating an alert system to the air traffic controller located at the radar operational post, in case the aircraft transponder information is lost. Such procedure consists in the inclusion of new functionalities in the ATC software, in order to provide sound and/or visual alarms on the operational console, in case of a specific failure. For attending the safety recommendation, the tag field related to the aircraft altimetry will be replaced by warning symbols; in case of the mode “C” information is lost.

## **6. Conclusion**

6.1 As it may be observed in this information paper, after the terrible mid-air accident between the PR-GTD and N600XL aircraft, the Brazilian administration has, immediately, taken the necessary actions to prevent and investigate future accidents of that nature.

6.2 All the actions that could be taken within Brazilian sphere are being launched, including the implementation of some preliminary safety recommendations; even the investigation is not yet concluded.