

Answers drafted by:

- The team for informing the public opinion of the contents of information and materials, concerning the causes and circumstances of the airplane crash of April 10th, 2010 near Smolensk - controlled by Prime Minister Tusk (Final and official Polish governmental 'Miller' report)

1. Is it possible that the plane lost part of its wing after supposedly hitting a birch tree, taking into account, firstly the location of this tree and secondly its thickness, wood density, airplane speed etc.?

Yes, it is possible that part of the wing was severed after contact with the birch tree. After analysing data of the flight parameters recorder (both the recorder QAR-ATM manufactured in Poland and the recorders manufactured in Russia) the lowest airplane flight altitude above ground level registered in the memory of the recorders was 6.2 m. On the basis of the data retrieved from recorders and taking into account the natural topography in front of the Smolensk airport, as well as the traces left by the airplane flying low above ground level (described in annex 4 – The Geometry of the Aeroplane Crash), the aeroplane hit the birch tree with the left wing. The altitude of the airplane flight above the runway level was app. 1.1 m at the moment of the crash. If the airplane crew had performed correctly the go-around manoeuvre, the aeroplane flight altitude at this time should not have been lower than 100 m. above the runway and in the case of a correct landing approach it should have been 55 m. The elements of wing structure rammed into the birch tree trunk as well as tree fragments found in the part of the wing which had been ripped away, typical for the crash of the thin-walled structure with a uniform obstacle confirm the course of events described in the report.

We would like to point out as well that the materials from the Smolensk Conference dated 22.10.2012, which presented the results of work of the representatives of the scientific world include the paper published on page 73, entitled “The Smolensk birch- strength aspects of Tu-154 aeroplane wing structure”. The author of this paper is Jan Błaszczuk, Ph.D., an acknowledged authority in the area of aircraft structures, their strength and aerodynamics, a retired employee of the Military Technical Academy. This paper contains the answer to the above question in the form of a scientific argument.

The accident of 29.09.2006 can be quoted as an example of the possibility of substantial aircraft wing damage by a much weaker element: during this accident the Embraer EMB-135BJ airplane cut off with a winglet (a bent-up wing tip) almost half a wing of a Boeing B737-800 aircraft, as a result of which the Boeing crew lost control of the aeroplane; this led to its crash against the ground and the death of all persons present on board. The Embraer aeroplane landed safely at the nearest airport.

Yet another example can be the experiments conducted by the Federal Aviation Administration (FAA) in the 60s, at the time of the crash tests of DC-7 aeroplane (on 24.04.1964) and Constellation aeroplane (on 3.09.1964) with wooden telegraphic poles. The speed of the DC-7 aeroplane crash with the obstacle was close to the flight speed of Tu-154M. In each of the experiments quoted above, the wing tip was ripped away as a result of the crash.

2. Could the aeroplane after an alleged crash with the tree at an altitude of a couple of meters - lose the wing, rise again and perform the so-called barrel roll?

As a result of the initiation of the go-around manoeuvre by the crew (the increase of engine power and the displacement of the elevator) the aeroplane started to rise. Due to very small altitude of the initiation of this manoeuvre (12.5 m above ground level) as well as the natural topography, the aeroplane, despite the initiation of rising was flying in a parallel manner to the rising ground. At the moment of the crash with the birch the aeroplane was pitched upwards at an angle of 12.8 degree and it was rising. After the crash with the tree the loss of 1/3 length of the left wing resulted in the rolling moment, which tilted the aeroplane leftwards (the left aileron was ripped away together with the ripped wing tip), which was impossible to compensate by the pilot by the maximum right aileron displacement (the actions of the pilot have been confirmed by the data stored by the flight recorder). The unbalanced rolling moment led to the gradual increase of the bank angle of the aeroplane during further increase of the flight altitude (the beginning of the roll is clearly recorded in the recorded flight parameters), resulting from the operation of engines running to the full and a huge bank angle of the aeroplane flight trajectory. As a result of the aeroplane roll to the left it started to descend again after a certain angle had been exceeded. Finally the plane crashed to the ground, touching it with the remnants of the left wing at a negative pitch of app. 6° and the banking of app. -150 – (Appendix 4: The geometry of aeroplane crash, drawings 15 and 16). The trajectory of the aeroplane flight from the crash with the birch until the crash with the ground is confirmed by the traces left as a result of the aeroplane structure contact with the trees.

The course of the last flight stage described in the report and in the annexes was confirmed independently by the simulations performed by professors Paweł Artymowicz and Grzegorz Kowaleczko. The results of their work have been published, among others, in the materials from the 15th Conference “Mechanics in Aviation”, which took place in Kazimierz Dolny in May 2012.

The crash of the DC-9-30 Southern Airways 932 aeroplane which occurred in Huntington (USA) on 14.11.1970 can be an example of a very similar accident. During the landing approach without the ILS system in difficult weather conditions the aeroplane descended below the minimum descending altitude, hit the trees and after performing a half barrel roll it crashed to the ground in the inverted position. All persons present on the board of the aeroplane died.

3. How is it possible that the aeroplane, falling from an altitude of a couple / ten-odd meters with the speed of app. 270-280 km/hour, could completely crash when hitting against the muddy ground?

The aeroplane hit the ground at the speed of 270-280 km/h. All analyses which have not taken into account the advancing speed [towards the ground] of the aeroplane at the moment of the crash, but taking into account only its vertical component [the value of the falling speed], lead to erroneous conclusions. It should be remembered that the aeroplane hit the ground with the weakest element of its structure. The

thickness of the metal sheeting of the upper front part of the fuselage is barely 1.2 mm.

The pictures of other accidents, which occurred during the landing approach could also be presented, during which the aeroplane got completely destroyed as a result of the crash against the ground (DC-9-30 Southern Airways 932, Airbus A330 Afriqiyah Airways 771).

4. Haven't some people survived similar crashes? The aeroplane with the president of Mozambique crashed when hitting the mountain side at the speed of app. 400 km/h at an angle; still. Some passengers survived. It happened in the 80s and the aeroplane was Tu-134, a machine with a structure similar to the Tu-154.

Each accident occurs in unique circumstances, although, as indicated by the statistics, often their causes are similar. Therefore each accident in the discussed scope should be considered separately and investigated taking into account all circumstances, and especially the position and speed of the aeroplane, the site where it crashed to the ground etc. The comparison of pictures taken after the accident of small aeroplanes, which were presented to the general public with a view to demonstrating that the side no. 101 of the Tu-154M aeroplane "should not have been" subject to such damage is a far-fetched simplification and it can only be hoped for that it was not an intentional manipulation attempt. The comparison of the accident of the aeroplane Tu-154M no. 101 with the experiment consisting in the controlled crash of the Boeing B727 aeroplane or the accident of the Boeing B737 aeroplane in the area of the Schiphol airport near Amsterdam does not represent the course of events of the Tu-154M aeroplane near Smolensk. In this case the crash occurred in an inverted position, which is quite rare in commercial aviation. The sheeting of the wings and the fuselage, and especially the passenger section of the aeroplane are not designed with the view to the loads transfer, which are the result of the crashes against the obstacles, including the ground.

5. Do you consider that the wreckage examination, its protection, the protection of the area and its inspection aimed at finding the remains of the victims as well as any evidence was adequate?

Area protection and its inspection as well as the protection of the wreck was managed by the host of the area, i.e. the Russian Federation. The SACIAA conducted relevant inspection and measurements of the wreck fragments of the TU-154M aeroplane for its own needs together with extensive photographic documentation (approximately 1200 pictures of the accident site and the aeroplane remains), and their results were taken into account during the preparation of the crash investigation report.

6. Do you know which Polish experts were on the crash site and which tests were conducted immediately after the crash (and if so, at what time and on which day were they conducted)?

The final report contains the information on the composition of the Committee conducting the examination; however, it does not contain the list of all persons who were engaged in the preparation of specialist expert's opinions. These data are contained in the source materials, e.g. in the expert's study prepared by Universal Avionics. The persons delegated to the accident site on April 10th, 2010 and in the subsequent days included, among others, the representatives of the Flight Safety Inspectorate at the Ministry of the Defence as well as other specialists who had been considered necessary for the initiation of the proceedings. Many of these persons were performing the function of an accredited advisor of the representative of Poland and at the same time the majority of them were appointed on April 15th, 2010 to form a part of the Polish Committee in charge of the investigation of the Tu-154M aeroplane with the side number 101. These persons between April 10th and 11th 2010 flew to Smolensk, where they worked until April 23rd, 2010. Detailed information was transmitted in the form of dispatches and reports of the military services sent from Smolensk. The pictures of the aeroplane wreck and terrain obstacles made by the members of the Committee as well as the measurements of aeroplane actuators, and the inspection of motors and the wreck, the condition of navigation lights at the airport and the recordings from the control tower at the Northern Smolensk airport were performed at that time. Thanks to these recordings the Committee could conduct the analysis of the activities of Russian flight control services [points 2.12.4 to 2.13 of the Final Report]. Committee representatives, acting as advisors of the accredited representative, participated in the interrogation of the group in charge of flight control at the Northern Smolensk airport. The group of Polish specialists was forced to terminate their tests in Smolensk the moment the accredited representative had left.

After the recorders from the Tu-154M aeroplane with the side no. 101 had been found, they were protected until the arrival of Polish specialists, and then they were transported to the laboratory in Moscow with their consent and in their presence, where the Polish specialists opened them; after that the data recorded on source carriers were copied in their presence and digitized; these digitized data were the basis for the data analysis for the involved specialists. The credibility of the copied data was confirmed by specialist Polish institutions (the MIS (Military Intelligence Service), the CCL (Central Criminalistics Laboratory), and the ATM). At a later date, after the end of Committee works, such confirmation was made by the Institute of Judicial Expert Evidence working upon the order of the Prosecutor's Office.

Polish specialist delegated to the USA participated personally in the recovery of data from FMS and TAWS devices produced by Universal Avionics, and he delivered the results of these works to the SACIAA.

It should be also reminded that the records saved in the Polish recorder QAR-ATM were read in Poland by Polish specialists in the Technical Institute of Air Forces, since only the Polish producer is acquainted with the method of encoding of these data.

The records saved by voice recorders in the cabin and flight parameters as well as the data obtained from the FMS and TAWS devices are coherent and enable the clear determination of the course of events.

7. Could the appointment of an international committee or the resumption of the SACIAA works bring anything new to the case, and if so, what would that be?

The resumption of accident investigation is possible whenever new facts have been established, which were not known during investigation, provided that they impact the determination of the accident cause or the preventive recommendations. The cases of appointment of “the international committee” are sporadic and such appointments require the consent of all the interested parties. It would be necessary to establish appropriate legal conditions in the form of an agreement respected by all the signatories in order to ensure the effectiveness of operation of such “international committee”. In the history of aviation accident investigation there were also cases of states that could not co-operate with one another; in such circumstances separate reports were drawn up and published, in which the committees from these states presented their opinions on the causes and circumstances of the event.

In the case of aviation accidents with the participation of civil aeroplanes/ the crew, the provisions of the Convention on International Civil Aviation apply [article 26 of the Chicago Convention] as well as international standards and recommended proceedings contained in Appendix 13 to the Convention [Appendix 13]. These standards are successfully applied all over the world. Appendix 13 contains, among others, the principles of participation of the representatives of the interested states in the investigation (accredited representatives and their advisors), the scope of their rights and the limitations concerning e.g. the dissemination of information.

The persons specializing in international law could provide a very detailed answer to the question concerning the possibility of appointment of the so-called “international committee”, especially the persons specializing in the treaty law, and more specifically in the aviation law, e.g. from the International Aviation and Space Law Department at Warsaw University. It should be stressed, however, that international law is characterised by: the lack of supranational law maker, the lack of organized enforcement apparatus and the lack of obligatory international judiciary. These characteristics result from the fact that international law is applied primarily to the relations between sovereign entities (states), which means that in practice no state can be forced to sign an international agreement in which it does not want to participate. “The international committee” would have to be appointed in compliance with the international law. The materials, on the basis of which it would conduct investigation would also have to be submitted by the Russian side. With reference to the above it is worth noting how many motions contained in the “Comments of the Republic of Poland being the registration and operator’s state to the draft final report from the investigation of the accident of the Tu-154M aeroplane with the side no. 101 (...)” have not been put into practice. At the same time it should be noted that these materials primarily concern the scope of information in the area of military activities [state defence and security], and even the Polish side was not willing to transfer its own information from this area which the Russian side had applied for.

8. Were the tests conducted during post-mortem examinations and after them as well as the tests of the aeroplane remains detailed

enough in order to confirm or rule out the possibility of explosions on the board of the aeroplane?

The tests conducted by the members of the State Aviation Committee for the Investigation of Aircraft Accidents, both at the accident site and during the analysis of data saved on conversation recorders did not confirm the hypothesis of the detonation of explosive materials.

The detonation of explosive materials is always accompanied by a rapid increase of temperature, pressure and the sound of explosion. Both the wing which was ripped away bearing the signs of the crash with the birch and fuselage elements did not show any partial melting signs, which could be caused by high temperature. The so-called differential pressure, i.e. the difference between the pressure inside the cabin and the pressure outside the aeroplane is recorded in the aeroplane every half a second. In the case of the explosion its result in the form of pressure increase would be present in the recorded data. Still, the recorder of flight parameters did not record even the slightest pressure increase.

What is more, the explosion sound would be saved by the voice recorder by the microphones located in the cockpit, which recorded the sounds in the cabin in a continuous manner. On the basis of the replays performed by the SACIAA, the MIS and the CCL, as well as the replay [performed just after the completion of the Committee's works] by the Institute of Judicial Expert Evidence it can be determined beyond any doubt that no explosion took place.

Additionally, none of the witnesses present at the airport mentions the boom which would accompany an explosion. Both Mr Artur Wosztyl, a Yak pilot and Ms Aneta Żulińska-Pondo, a stewardess [public statements of both witnesses given to the media] heard the roaring sound of engines working with increasing power and after a while- a hollow crash of breaking or crushed metal sheet and the silence. Since they were able to hear the sound of increasing engine power, it is clear that they would have been even more able to hear the explosion.

The alleged explosion in the wing centre section suggested by some persons would definitely lead to the explosion of app. 11 tons of fuel and a gigantic fire. None of the above occurred.

The question about the results of the post-mortem examination should be directed to the competent Military Prosecutor's Office. The committees in charge of aviation incidents investigation do not conduct such examinations themselves for preventive purposes, but they use the results of the expert's studies made by competent centres. The submitted materials from such expert's studies did not give any reason for the presentation of a thesis on the detonation of explosive materials.

9. In your opinion, to which degree can the IAC committee be described as an independent, international and credible institution, the actions of which are free of conflict of interest with reference to the Smolensk crash case?

The Interstate Aviation Committee is an organization which has been officially acknowledged by ICAO and authorised to investigate, among others, the accidents of

civil aircrafts on the territory of the Russian Federation. In this scope it is also subject to ICAO audits. Therefore the question about the independence and credibility of this institution should be directed to ICAO.

It should be also reminded at this point that the Polish side submitted 150 pages of comments and reservations to the draft report prepared by the Russian side (the IAC). These comments were prepared by the members of the State Aviation Committee for the Investigation of Aircraft Accidents. When reading these comments one can surely note huge reservations as to the findings made by the IAC Committee. The comments were summed up by means of the following conclusion:

“In relation to the above the Polish side applies for the reformulation of caused and circumstances of the accident of the Tu-154M aeroplane as well as preventive recommendations, which should take into account all factors that had led to the accident, including the ones described herein.”

It is regrettable that the Russian side did not initiate a dialogue with Polish specialists and that it decided to terminate the investigation without taking into account the comments presented by the Polish side and that it only attached these comments as an annex to its report, in compliance with the second sentence of section 6.3 of Appendix 13 to the Chicago Convention.

10. Are there any other institutions / centres that are in your opinion competent and credible in the area of aviation crash investigations, especially in the view of the fact that our country is a member of NATO and the EU?

In compliance with the principles adopted in civil aviation, the state on the territory of which the aviation accident took place shall implement the so-called technical investigation procedure. This investigation is conducted solely for preventive purposes, i.e. with the view to developing recommendations concerning safety: in other words, with the view to determining what should be done in the current procedures or the manner of training to prevent the occurrence of accidents with such catastrophic consequences in the future.

The investigation conducted by the Prosecutor's Office with the view to determination whether a crime had been committed, who had committed a prohibited act and who is guilty and with the view to bringing the persons responsible for the occurrence of the accident to justice is a completely different process. The investigation conducted by the Prosecutor's Office and the committee is conducted separately and independently.

Each state being the signatory of the Convention on the International Civil Aviation has [or should have] an independent body for the investigation of aviation accidents. In April 2010 in Poland there was only one fixed state committee in the area of civil aviation, while in the area of state aviation it was appointed ad hoc, i.e. separately for the investigation of each single accident. At the same time it should be stressed that specific committees of the states which are the signatories of the Chicago Convention are the bodies of independent and sovereign states. The states which are the signatories of the Convention have to notify in which scope they will not comply with the standards and principles of conduct, presented in the Appendixes to the

Convention. Each of the civil committees is periodically audited by ICAO against its compliance with the standards recommended in Appendix 13. The states which are the signatories of the Convention have not appointed any joint body of international nature in the European area, which would be entrusted with the investigation of aviation accidents for preventive purposes or which could verify the results and findings of tests conducted by specific committees.

The investigation system was structured in a manner enabling the participation of representatives of interested states in the investigation conducted by the state on the territory of which the accident took place. The state participation is guaranteed in the form of participation of an accredited representative and his/her advisors. Moreover, the right of getting acquainted with the draft report and presenting comments as to its contents has also been ensured. The states entitled to exercise this right are the ones that have introduced their representative, who is commonly referred to as "the accredited person" into the investigation or that provided technical assistance during the investigation. As already mentioned, all rights and responsibilities of such co-operation that the member states being the signatories of the Convention agreed to have been specified in Appendix 13 [also referred to as Annex 13].

An unwritten principle states that the competences of the bodies conducting the investigation for preventive purposes should not be mutually undermined. Objection of a certain type to the findings presented in the final report can be raised in the form of comments to the draft report. These comments should be substantial and balanced. Some committees use these comments and they introduce appropriate adjustments. Still, any body in charge of the investigation can decide against taking the comments into account, but then upon a clear request of the party presenting the comments it must attach these comments which have not been taken into account to the final report.

The investigation of accidents in military aviation in NATO member states has been described in the STANAG standard, which specifies (among others) the procedures and the scope of investigation of military aeroplanes of the Treaty, which occurred on the territory of another NATO member state. The question about the evaluation of competences of these bodies should be directed to the Ministry of National Defence.

The experience of Polish investigators of aviation accidents indicates that in principle both in the civil and in the military area the bodies in charge of conducting the investigation of aviation events of international importance, i.e. which occurred on the territory within the scope of their activities with the participation of foreign aircrafts, try to conduct such investigation in a reliable manner, using all available means and possibilities, since they are fully aware that international community of aviation accident investigators is following their work and the conclusions made by them.

During the meetings of representatives of the bodies conducting investigation in the area of civil aviation of specific states often discuss the problems encountered by the investigators during the conducted activities. These meetings also serve as an occasion for the presentation of test results and the discussion of preventive recommendations. Under conducted co-operation the committees can agree to transfer accident investigation powers or use the assistance of other investigation bodies. However, this system has been introduced into civil aviation and not the state one. Therefore one cannot quote the solutions applied in the area of civil aviation and demand the application of such solutions in the area of state [military] aviation.

The member states forming a part of the European Union created the European Network of Civil Aviation Safety Investigation Authorities. In compliance with article 7(2) of the Resolution of the European Parliament and the Council (EU) no. 996/2010 of 20th October 2010 on the investigation and prevention of accidents and incidents in s in civil aviation and repealing the Directive 94/56/EC:

“The Network shall seek to further improve the quality of investigations conducted by safety investigation authorities and to strengthen their independence. In particular, it shall encourage high standards in investigation methods and investigator training”

European Network of Civil Aviation Safety Investigation Authorities has not been given the right to investigate or to verify the findings made by the bodies in charge of aviation safety investigation of specific member states. Article 7 (3) of the above-mentioned regulation indicates that the Network can: “[...] co-ordinate and organize, in justified circumstances, mutual evaluation, initiate respective training measures as well as training programmes and co-ordinate the enhancement of investigator qualifications; [...]”. It should be pointed out that the Network is not authorised to conduct evaluation, but to co-ordinate and organize “mutual evaluation”, which means the situation when organization audits are being conducted, in which specific bodies investigating aviation incidents can participate voluntarily in the scope which has been specified earlier and approved by them. It should be stressed once again that the scope of competences of the Network lies exclusively in the area of civil aviation.

With reference to the NATO structures, the principle of conducting investigation of aviation incidents and co-operation in that area have been defined in the so-called STANAG (3531), which were introduced in the form of a Defence Standard (05-A001:2010) upon the decision no. 169 by the Minister of National Defence of May 10th, 2010 on the approval and introduction of standardization documents concerning state defence and security.

Finally it should be indicated that the Russian Federation is not a member of the European Union and that it does not belong to NATO structures, with which it only maintains partner relations.

Answers drafted by:

- The team for informing the public opinion of the contents of information and materials, concerning the causes and circumstances of the airplane crash of April 10th, 2010 near Smolensk - controlled by Prime Minister Tusk (Final and official Polish governmental 'Miller' report)