Cases of the Commercial Aircraft Forced Landing Caused by Procedural and Military Means as a Factor Affecting Air Transport Safety

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***Abstract*—Commercial aviation covers the entire world. Therefore, there are situations where it operates in regions threatened by armed or political conflicts and is drawn into the international game of influence and pressure between states and non-state entities. Commercial planes have been shot down, both as a result of mistakes and deliberate actions. In this article, however, the focus will be on the possibility of forcing a commercial aircraft to reroute or land by legal, political and physical means.**

Keywords—commercial aviation, transport security, FR 4978, SP-RSM, Belarus, air traffic

I. INTRODUCTION

International Civil Air Traffic Regulations published by International Civil Aviation Organization (ICAO) provide the possibility of interception of civil aircraft by military aircraft, provided that several conditions are met [8]. First of all, an interception may occur if a civilian aircraft does not maintain two-way radio communication on a frequency determined by ATC air traffic control services, does not respond to calls, and when a civilian aircraft enters the airspace without express or implied consent. This may be related to the unauthorized crossing of a state border, as well as the boundary of a restricted area (e.g. entry ban) within a given state. Interception of civil aircraft should only be used as a last resort. ICAO also states that practice interception of civil aircraft should not be performed (ICAO Appendix 2, p. ATT-A1). Practicing such exercises would cause difficulties in air traffic control (problems with ensuring separation between intercepting military ships and civilian traffic), and could also arouse fear among passengers who would unexpectedly see a military plane outside the window in the immediate vicinity. Such practices have occurred in the past. For example, Tornado ADV fighters belonging to the British RAF air force sometimes tried to intercept Concorde supersonic airliners over the ocean, which by the way turned out to be very difficult [9].

The ICAO regulations also detail differences in interception procedures taking place in visual and non-visibility, i.e., instrument flight rules (IFR) flight conditions.

II. PROCEDURES FOR INTERCEPTION OF CIVIL AIRCRAFT BY MILITARY AIRCRAFT IN VMC (VISUAL METEOROLOGICAL CONDITIONS)

In a situation where two military aircraft are involved in the interception, the first of them (the leading one) approaches the intercepted civilian aircraft, and the second military aircraft takes an observation position at some distance.

In Phase I, one of the military ships approaches the intercepted object from behind for the distance needed to identify the current state of the intercepted machine. ICAO states: *The intercepting aircraft should approach the intercepted aircraft from astern. The element leader, or the single intercepting aircraft, should normally take up a position on the left (port) side, slightly above and ahead of the intercepted aircraft, within the field of view of the pilot of the intercepted aircraft, and initially not closer to the aircraft than 300 m* (ICAO Annex 2, ATT A-2, 3.3).

W It is assumed that if military machines do not have ICAO compliant transponders turned on, they may fly in such a way that they can be noticed by passengers. ICAO even recommends disabling transponders, namely transmitting barometric altitude information (in Mode C responses or in Mode S responses in the AC field) at a distance of at least 37 km (20 NM) from the intercepted aircraft. The operation of the transponder at shorter distances could activate the ACAS / TCAS on-board anti-collision system in the intercepted aircraft (ICAO Annex 2, APP 2-1).

Pilots in the cabin of a typical commercial aircraft have very little possibility of seeing such an external object visually. The interceptor should maneuver calmly in order not to panic the passengers. The military interceptor which is on front position should be positioned slightly ahead, higher and to the left of the intercepted commercial aircraft. ICAO also states: *It is indispensable that the pilot-in-command of the intercepting aircraft be satisfied that the pilot-in-command of the intercepted aircraft is aware of the interception and acknowledges the signals given. If repeated attempts to attract the attention of the pilot-in-command of the intercepted aircraft by use of the Series 1 signal in Appendix 1, Section 2, are unsuccessful,* ***other methods of signalling may be used for this purpose, including as a last resort the visual effect of the reheat/afterburner, provided that no hazard is created for the intercepted aircraft*** (bold - J.M.; ICAO Annex 2, APP 2-1, 3.4.2).

The use of a warning fire with a cannon is therefore not recommended, although the above provision does not explicitly prohibit it. It is worth noting that the above record was made several months before the Korean Boeing 747 (flight number KAL 007) was shot down over Sakhalin by the Soviet Su-15 fighter. In addition, a few years earlier - on April 20, 1978, another South Korean plane, Boeing 707 (flight number KAL 902) was shot down by a Soviet Su-15 near Murmansk - this time, however, Boeing managed to land in the field, because it was hit by the light R-60 (AA-8) missile. There were also other similar incidents around the world, which undoubtedly influenced the above-mentioned ICAO record.

In phase II *The element leader, or the single intercepting aircraft, should begin closing in gently on the intercepted aircraft, at the same level, until no closer than absolutely necessary to obtain the information needed. The element leader, or the single intercepting aircraft, should use caution to avoid startling the flight crew or the passengers of the intercepted aircraft, keeping constantly in mind the fact that manoeuvres considered normal to an intercepting aircraft may be considered hazardous to passengers and crews of civil aircraft. Any other participating aircraft should continue to stay well clear of the intercepted aircraft. Upon completion of identification, the intercepting aircraft should withdraw from the vicinity of the intercepted aircraft as outlined in Phase III* (ICAO Annex 2, APP 2-1, 3.3).

It then moves on to Phase III, which is described by ICAO as follows: *The element leader, or the single intercepting aircraft, should break gently away from the intercepted aircraft in a shallow dive. Any other participating aircraft should stay well clear of the intercepted aircraft and rejoin their leader* (ICAO Annex 2, APP 2-1, 3.3).

III. Intercept without visibility (IMC - IFR Meteorological Conditions)

In such a situation, it is assumed that the intercepting machine will be within the radar range behind the intercepted aircraft and will maintain safe separation (also vertical). In both cases, the crew of the intercepted aircraft should follow ICAO rules, read the signals sent by the intercepting aircraft and respond accordingly. The crew of a commercial aircraft should notify the appropriate ATC air traffic control unit and attempt to establish radio communication on the 243.0 MHz or 121.5 MHz danger frequency, specifying the code (callsign), registration marks, aircraft location and type of the flight.

The crew of the commercial aircraft should set the mod A Squawk 7700 emergency code on the transponder, unless otherwise instructed. If the aircraft is equipped with an ADS-B or ADS-C device, it shall select the appropriate distress function, if available, unless otherwise instructed by the air traffic services unit. If instructions received from air traffic services conflict with those received from the intercepting aircraft crews, they should try to explain this but still follow the instructions received from the intercepting military aircraft.

It is worth noting that the crew of an intercepted commercial aircraft should adjust the speed to the needs of the intercepting fighters. For example, turboprop airplanes, in the event of interception by jets, should maintain IAS speed above 200 kt, in order not to cause problems for jets in maintaining position in formation. Bringing military machines to an intercepted commercial aircraft also requires special actions from the Air Traffic Control (including separation from other air traffic) and special attention.

IV. Other methods of influencing the flight course of a commercial aircraft

By law, the commander of the commercial aircraft is its captain, who makes the final decisions. In some situations, however, the captain may be forced by external factors to change the planned course of the flight. This article focuses on factors related to national and international security issues. Such factors include various acts of unlawful interference (kidnappings or threats on a criminal or terrorist-political basis) and the dissemination of information that may disrupt the course of the flight (e.g. a phone call about a bomb on the plane or at the airport - it is worth noting that such telephone information about the alleged bomb at Gran Canaria airport made it necessary to divert many planes to Tenerife airport on March 27, 1977, where two Boeing 747s collided as a result of the disturbance caused by this, killing 583 people in total).

A commercial airplane is an attractive target for various types of activities that threaten security due to the high media coverage of such events and the possibility of intercepting certain people or property. In addition to the possibility of shooting, one of the options for interfering with the course of a commercial aircraft flight is forcing its crew to change the flight route and land in a place other than planned. It is quite a difficult and complex undertaking and often requires far-reaching actions of military and intelligence services, but such situations have already taken place several times.

V. Cases of forcing a commercial airplane to land by military aircraft in the 20th century

For example, on August 10, 1973, the Caravelle passenger plane used by Lebanese Middle East Airlines (MEA) shortly after taking off from Beirut was intercepted by Israeli Mirage III Shahak fighters and forced to land at Lod Airport in Israel. Israel suspected that there were terrorists on board responsible for the attack at the Athens airport on August 5, 1973. These suspicions did not materialize, so the plane was released. Lebanon filed a complaint with the United Nations condemning this Israeli action. There were suspicions in the press that Israeli fighters mistakenly intercepted the MEA 006A flight, instead of the MEA 006, which took off with some delay. Both flights were due to end in Baghdad. It was the MEA 006A flight with a Caravelle plane chartered to Iraqi airlines that was intercepted near Beirut and forced to land at an Israeli military airport [11].

A similar event occurred on February 4, 1986, when Israeli fighters intercepted a private Libyan Gulfstream II (LN777) near Cyprus and forced it to land in Israel. There were concerns that Palestinian terrorists were on board. No wanted person was found there, so after a few hours the plane was released and flew to Damascus [4].

The most spectacular incident took place a few months earlier, on the night of October 10-11, 1985, when American F-14 Tomcat fighters forced an Egyptian Boeing 7378 to land in Italy. We briefly present here the history of the events that led to the incident [7].

On September 25, 1985, Palestinian terrorists abducted and murdered three Israeli tourists traveling on a yacht near Cyprus. This was probably retaliation for the recent arrest by

the Israeli services of one of the leaders of the Palestinian Liberation Organization (PLO). In turn, for the murder of the mentioned tourists, Israeli F-15s bombed the PLO headquarters in Tunisia. In retaliation for this act, PLO members pretending to be tourists boarded the Italian liner ship Achille Lauro on October 3, on which they planned to travel to Ashdod, Israel, to attack refineries or military facilities. However, the plot was uncovered, which forced the terrorists to change their plans. They decided to hijack a ship and order the release of 50 Palestinians from Israeli prisons. This was not fulfilled, so the hijackers did shot the American tourist. On October 9, the hijackers left the ship.

The spectacular murder of an American citizen caused American public outrage and a quick reaction from the US authorities. At that time, the American aircraft carrier USS Saratoga (CV 60) was in the Adriatic Sea and was heading towards Dubrovnik, where it was to pay a courtesy visit. As a result of the hijacking of an Italian ship, Saratoga changed course and began preparations for combat action. F-14 fighters equipped with TARP reconnaissance pods took off from its deck, whose task was to find and observe Achille Lauro. This material was to be used during the planned rehashing of the ship by commandos, but the action was canceled because the ship had anchored in Port Said, Egypt.

The next day, Israeli intelligence notified the US side that the four hijackers were at Al Maza Airport near Cairo and were likely to fly to Tunisia. It was agreed that they would fly over Mediterranean Sea, as Egypt did not have very good relations with Chad and Libya at that time. Then Admiral James Stark of the US Navy proposed that the fighters can intercept an Egyptian plane and force it to land in Sicily. This idea was accepted by President Reagan.

On the USS Saratoga, 9 F-14 were planned for this purpose and received signal tracer ammunition for the cannons, as you can see in this case, cannons were envisaged to intimidate Egyptian pilots. The cannon bullets were to be clearly visible from the Boeing cockpit. The operation was secured by E-2 early warning aircraft, two flying tankers and radio-electronic warfare aircraft. There were also next 3 F-14 and 2 E-2 kept in the reserve.

Fig. 1. Boeing 737 SU-AYK of the EgyptAir airlines [28]

In the meantime, Israeli services have established all the data on the Egyptian aircraft - type, condition and registration marks. It was Boeing 737-266 with registration SU-AYK of EgyptAir airlines.

E-2 crews searched by the radar all planes traveling from Egypt to Tunisia, but they could not identify precisely detected targets. It was difficult to say whether the Boeing was flying with the transponder turned off, or whether the state of the art at the time did not allow reading transponder signals from a long distance. In order to identify them, the F-14 fighters approached each of the detected objects and made a final visual verification. It must be admitted that such activities are not in line with the international regulations of general air traffic (GAT - General Air Traffic), which is strictly separated from operational traffic (OAT - Operational Air Traffic, which is mainly military). Undoubtedly, the permissible minima for vertical and horizontal separation, as described in the ICAO Doc. 444 Air Traffic Management manual were exceeded there. The F-14 fighters had their lighting turned off and possibly their transponders were turned off also (or possibly broadcasting only a signal on secret military IFF frequencies received only by US military systems). F-14s flew up to each plane and judged in the light of the stars whether a given silhouette resembled a Boeing 737. If so, they did fly closer to read the markings. In the meantime, the F-14s intercepted e.g. two large light-turned-off planes that turned out to be American C-141 from USAF carrying commandos from Cyprus to Sigonella base in Sicily, where they would take part in the seizure of the Egyptian Boeing. Around 11 p.m., the wanted Boeing 737 SU-AYK was found. After consultations with the air traffic services, ATC controllers at Tunis and Athens airports refused permission to land for that Egyptian airplane.

A radar controller on an American E-2 plane radioed to the crew of the Egyptian Boeing and ordered a landing at the Sigonella base in Sicily. When the Egyptians refused, the nearby F-14 fighters turned on the lights, which was noticed by the Egyptian crew. From then on, the Egyptians began to carry out the orders of the Americans and headed towards Sicily. However, Italian ATC services refused to allow entry, explaining this because of the lack of a filled flight plan. Filing a flight plan by radio takes only a few minutes, but the Americans decided to use an effective ruse. One of the F-14s reported an emergency and asked for an immediate landing in Sigonella, which the Italians had to agree to according to the regulations. Thus, the Egyptian Boeing approached at Sigonella Airport in the presence of an F-14, and landed there on October 11, 1985 at around 00.45. The American fighters returned to the carrier.

Shortly after the Egyptian Boeing, two American C-141 transport aircraft with around 80 commandos also landed at Sigonalla. American commandos surrounded the Egyptian plane, but in the meantime the Americans were surrounded by several hundred Italian soldiers. The commander of the American commandos then estimated that a possible fight with the Italian guard would not be without deaths, and that the removal of the Palestinian hijackers without cooperation with Italy was unlikely. No fight took place.

The Americans showed great determination to kidnap terrorists who killed US citizen, going so far as to violate ICAO's international aviation regulations and the inviolability of Italian airspace and territory. The government of the Italian Republic was, of course, furious and demanded that, since such an incident had already taken place, the Italian side should play the role of the superior, and terrorists should be brought to an Italian court. The case was very complicated, as it also involved the hijacking of an Italian-flagged ship in the territorial sea of Egypt and the murder of a US citizen by Palestinian citizens from Lebanon. In the end, international opinion agreed that Italy was right and the captured terrorists were imprisoned there. One of the people suspected of being involved in the attack on Italian ship Abu Abbas was released because he had a diplomatic passport and Egypt had confirmed its credibility. Ultimately, the Egyptian Boeing was allowed to fly to Rome with Abbas on board. Probably Rome

was the only destination for which the Egyptians were allowed to depart. To prevent Boeing from flying back to Egypt, SU-AYK was accompanied by an American T-39 aircraft that took off from a parallel runway without ATC permission. The T-39 accompanied the Egyptians until their approach to landing at Rome's Ciampino airport. When the ATC service of this airport denied the American T-39 the clearance to land, the Americans once again used a trick to report the emergency and finally landed in Ciampino.

Abu Abbas then flew to Yugoslavia on board that country's JAT national airlines. The authorities in Belgrade have released Abbas free despite US protests. Later, the Italian sentenced him in absentia to life imprisonment for steering the hijack of a ship. The Americans captured him many years later in 2003 in Baghdad. The remaining hijackers were sentenced by the Italian court to many years in prison.

US actions in this incident sparked lively discussions around the world. In many cases, they were considered illegal but morally justified. The international opinion has generally acknowledged that the fight against organized terrorism requires special methods, even if in some cases they are meant to violate certain civilized laws. Interestingly, the Americans were given some support in this case by the USSR, whose authorities described their behavior as understandable and justifiable. The Soviets added, however, that the Americans were also hypocritical, since they themselves refused to hand over two Lithuanians to the Soviet authorities, who in 1970 hijacked an Aeroflot plane to the West, killing a flight attendant [7].

VI. Ryanair flight on May 23, 2021

In May 2021, there was a precedent, politically motivated incident that met with great attention from the media and air safety specialists [1]. On May 23, the Boeing 737-8AS aircraft with Polish registration SP-RSM belonging to the Irish-Polish Ryanair Sun airlines made a scheduled flight FR 4987 from Athens (ICAO LGAV code) to Vilnius (EYVI). Polish company Ryanair Sun S.A. is part of the Irish group Ryanair Ltd. The headquarters of Ryanair Sun is in Warsaw at Cybernetyki 21 street. These lines are also known as Buzz [19]. Ryanair Sun S.A. lines (Buzz) have their IATA code RR for assigning flight numbers, but they often use the FR code assigned generally to the Irish group Ryanair Ltd. (hence the flight number FR 4987). Wikipedia says that the Polish airline Ryanair Sun S.A. (Buzz) owns 47 Boeing 737-800s, and a further 19 are on order [18]. Probably all of them (or most of them) are in the Polish Register of Civil Aircraft kept by the Civil Aviation Authority (CAA) in Warsaw, so they have registrations starting with the letters SP.

Fig. 2. Boeing 737 SP-RSM of the Ryanair Sun airlines [18]

Boeing 737-800 (8AS) number MSN 44791 and LN 6418 was entered into the Polish register in November 2019, where it received the marks SP-RSM. Earlier, from delivery to Ryanair Ltd. in May 2017, it wore the Irish EI-FZX registration [6, 24].

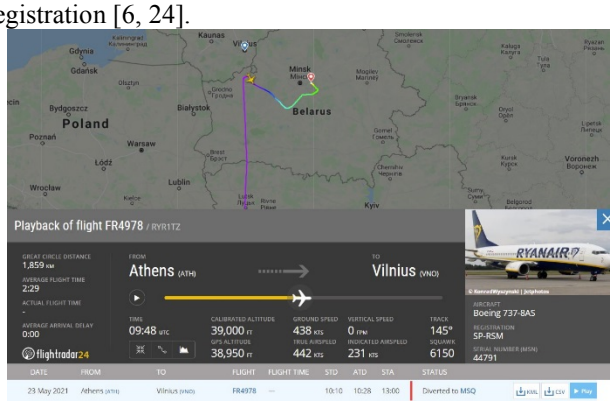

Fig. 3. Track of the FR 4987 flight on May 23, 2021 taken from Flightradar24 site [29]

There were 126 passengers and 6 flight and cabin crew members on board the Boeing during FR 4987 flight. One of the passengers was the Belarusian opposition activist Roman Protasiewicz and his partner Sofia Sapiega from Russia, who were returning from holidays in Greece. The take-off of the SP-RSM aircraft took place from the Athens-Eleftherios Venizelos airport (ICAO code LGAV) at 10:29 local time, with a delay of approximately 19 minutes. Landing in Vilnius was planned for 1:00 p.m. local time. Take-off, flight and scheduled landing times are based on UTC + 3 h (Eastern European Summer Time - EEST) in Greece, Ukraine and Lithuania. In May 2021, it was the same as the Moscow time in Belarus.

After about two hours of flight, crew of the Boeing was contacted by the Belarusian ATC area control service, informing that there was a bomb on the plane. At 12.45 LOC, while the Boeing was 45 nautical miles (83 km) from the Vilnius airport, the crew, following instructions from the Belarusian ATC, began a course change to approach Minsk airport (ICAO code UMMS). Boeing pilots set the emergency code 7700 on the transponder. According to some sources, the Boeing was supposed to be intercepted by the Belarusian MiG-29BM fighter from the 61st Fighter Air Base in Baranavichy, but this was not noticed on board the Boeing and there is no clear information on this. In the author's opinion, there are two possibilities in this regard: the fighter could not take off at all (although the MiGs in Baranavichy could be put in an emergency), or the MiG (or MiGs) took off, but was turned back so as not to exacerbate the situation. The Belarusian authorities could have realized that, in accordance with the ICAO regulations (cited earlier in this article), the interception of a commercial plane by a military aircraft can only legally occur if the crew of a civil aircraft does not maintain constant radio communication and does not respond to ATC commands. Meanwhile, the crew of the Ryanair plane was in constant contact with the Belarusian ATC and did not refuse to follow their instructions. Sending a fighter in such a situation could therefore be perceived as an infringement of powers and an act of air piracy on the part of Belarus. The more so because in this country there has already been an outrageous incident, when on September 12, 1995, the Belarusian military helicopter Mi-24 shot down a balloon of the US Virgin Islands representation near the Polish border, which took part in international competitions (XXXIX Gordon Bennett Cup). There is a possibility that the

crew of the downed balloon did not contact the air traffic control of Belarus before and did not respond to their calls due to loss of consciousness by oxygen deficiency. In addition, the Belarusians forced to land also two other American balloons participating in the competition.

It cannot be ruled out that perhaps the Belarusian MiG-29 was in the vicinity of the Boeing, but it had the transponder turned off (or it did not emit an ICAO-compliant signal; it might also have no ICAO transponder at all) and did not take any final actions (or not that, which were noticed by anyone aboard the Boeing, which would be unlikely).

Data from the Flightradar24 website indicate that at the time of the alert, Boeing was about twice as close to Vilnius (about 80 km) than to Minsk. Even in Belarus it was closer to the airports in Grodno and Lida. However, the crew decided not to fly into Lithuanian airspace, because information was received that terrorists wanted to detonate a bomb over Vilnius. Belarusian President Lukashenka later announced that the alleged bomb could also threaten the Belarusian nuclear power plant, and only Minsk airport accepted the plane to land. He also added that airports in Warsaw, Lviv and Kiev refused to accept the plane. The authorities of Warsaw-Okęcie airport, however, claim that they did not receive any questions regarding the acceptance of flight FR 4978 [6]. The records of Flightrad24 also show that the crew did not start the approach to the airport in Vilnius at all, and when they were in the place where the procedure should begin and where the plane should descend, the level flight was continued at the same altitude - possibly an exchange of correspondence with the Belarusian area control service was taking place at that time [1]. Due to official Belarusian sources, the terrorists allegedly were members of the radical Palestinian group Hamas, and their attack was allegedly directed against participants of the Delphi Economic Forum in Greece who support Israel [6]. It is unlikely, however. Maciej Lasek, the former head of the Polish State Commission for Aircraft Accident Investigation, said that the pilots had no possibility of opposition, and theoretically there was also a possibility of shooting down a Boeing SP-RSM in case if pilots refused to carry out the orders of the Belarusian services, although it was unlikely [27].

The Boeing SP-RSM landed in Minsk at 13.21 LOC. They took off for the further flight to Vilnius at 20.47 LOC after an intensive exchange of correspondence on the part of the Lithuanian diplomatic services and the representative for foreign affairs of the European Union. The Boeing SP-RSM landed in Vilnius forty minutes later at 21:27 UTC. However, 6 passengers did not board the plane - Roman Protasiewicz, his partner Sofia Sapiega and 4 Russian citizens (according to some sources, 1 Belarusian and 3 Russians; there are also information that only 3 people remained in Minsk, including a Greek citizen who intended to get to Minsk by Vilnius [6]), who, according to official information, refused to continue the flight because they intended to get to Minsk via Vilnius anyway. However, it cannot be ruled out that they could have been officers of the special services of Russia and Belarus, the more so as direct flights from Athens to Minsk are offered by several airlines and they did not have to make this trip with a change in Vilnius. The Russian and Belarusian services somehow determined which plane Protasiewicz would travel with - they probably had to hack into Ryanair's online ticketing system and / or have Greek airports under surveillance from which he could take off. No bomb or any other hazardous material was found aboard the Boeing.

There is no doubt that the false information about the bomb was only a pretext for the capture of Protasiewicz, which was very important to the authorities of Russia and Belarus. Protasewicz himself is described in these countries in a completely different way than in European Union and USA. Western and opposition media describe him as a fighter for freedom and human rights, while in the official Russian and Belarusian media he is portrayed as a trickster and terrorist involved in alleged criminal activities in eastern Ukraine [6].

The incident related to the flight FR 4978, which took place on May 23, 2021, caused the international community to raise several important safety and legal questions [1]:

- Was there a potential threat to passengers and crew?
- Was there actually a bomb on board?
- Did the plane have to land in Minsk?
- Was fighter airplane sent to intercept Boeing, and if so, was that action justified?
- What are the legal consequences of this incident?

The answers to some of the above questions can be found in the earlier part of this article. It is also worth referring to the legal issues of this event. Belarus is a member of the International Civil Aviation Organization ICAO, which in turn operates on behalf of the United Nations. This means that the country declares that it complies with the standards laid down by ICAO and the United Nations, and feels responsible for any cases of non-compliance with them in its own territory.

In legal terms, the flight of the Boeing SP-RSM took place based on several collective international agreements called aviation freedoms, which regulate what rights an aircraft registered in another country has over the territory of a given state. A description of aviation freedoms can be found on the ICAO website [21]. Flight FR 4978 did use the first and seventh freedom during the flight over Belarus. The first freedom is the right to fly over the territory of a third country without landing, and the seventh freedom is the privilege of carrying passengers and cargo between the territories of two different countries by aircraft registered in a third country, without landing in a third country. Aviation freedoms for non-EU countries are granted through bilateral agreements between states. Boeing of the FR 4987 flight had Polish registration SP-RSM, so the parties to the bilateral agreement in this case were Poland and Belarus. It is the Agreement between the Government of the Republic of Poland and the Government of the Republic of Belarus on civil aviation, signed in Warsaw on June 8, 1993. This agreement was issued in 1993, entered into force in 1996, but surprisingly, it was announced very late, on 23 September 2020 [18].

Under the ICAO regulations, did the Belarusian authorities have the right to strain the provisions of this agreement? Pursuant to Article 1 of the Chicago Convention (ICAO), each state has complete and exclusive sovereignty in the airspace over its territory (this is established by the so-called sovereignty principle). The rule is that every state has the right to refuse to fly foreign aircraft if it is required for safety reasons. This is mentioned, among others, by article 4 of the said bilateral agreement between Poland and Belarus. Each

state also has the right to make the passage of foreign aircraft over its territory subject to the specific rules it establishes. Each state also has the right to impose coercive measures against aircraft that do not comply with the instructions of the air traffic services (as long as they comply with ICAO regulations).

The fact is that flight FR 4987 posed no threat, considering that the alarm about the alleged bomb on board was just a lie created by the special services of Russia and Belarus in order to catch an oppositionist. If international services manage to prove such a thesis, it would also prove that Belarus broke the ICAO regulations and by spreading false information about the bomb, it created a dangerous situation in air traffic. It would also be a breach of the Convention for the Montreal Convention 1999. According to the media, violations of ICAO rules by Belarus should be considered very likely [25].

However, no complete information on a possible bomb on board FR 4987 is known. It has only been made known in general that extremist terrorist groups, possibly Hamas, are responsible. However, neither of them admits to this act. Initially, the crew received information from the Belarusian ATC that the bomb threat had been received from the Belarusian secret services, then it was announced that the source of the information were e-mails sent to several airports. There are also reports that such an e-mail was sent to the Minsk airport service mailbox several minutes after the Belarusian ATC informed the Boeing crew about the alleged bomb on board. In such a situation, the Belarusian authorities should immediately notify the Lithuanian authorities of the potential threat [1]. It is not known whether such correspondence has been established.

A separate issue is that from a formal point of view, the deck of an aircraft is an extra-territorial area of the state of registration of a given aircraft. Boeing flying FR 4978 has the Polish registration SP-RSM, so legally, its board belongs to the territory of Poland. If, therefore, officers of the Belarusian services (or any other) entered the plane, it would mean that they formally entered the territory of the Republic of Poland by force. However, according to reports that we have received, this did not happen, as all people on board left the plane voluntarily after receiving information about the bomb. Of course, an open question can be asked, whether forcing someone to leave the territory of a given state that protects them by a stratagem is not an abuse of authority and a crime? The matter is even more complicated as it was supposed to be an intra-EU flight, only a certain part of which was to go over an external countries, included Belarus.

The incident related to the flight of FR 4978 may set a dangerous precedent and tempt similar actions in the future around the world. At present, the matter is being dealt with by the legal bodies of the European Union and the case will undoubtedly have various consequences. So far, the main restriction introduced is the ban on the entry of Belarusian aircraft over the territory of the European Union, introduced on May 23, 2021. This ban was further detailed even later by adding a formal ban on the use of EU airports [2]. Authorities of the European Union, the USA and Canada have announced that entering Belarusian airspace is highly deprecated [3, 14]. As a result of the sanctions, the sky over Belarus almost emptied. Mainly lines from Russia (Aeroflot, Pabieda and S7) and China operate there. T. Hypki reports that only cargo carriers operate there from Western entities, including FedEx [6].

It is worth adding that a somewhat similar event took place on October 21, 2016, although it did not receive as much media publicity as the case of flight FR4978. On that day, Boeing 737-8ZM of Belarusian lines Belavia (Belavia) with registration EW-456PA, some time after taking off from Kiev airport, received an order from the Ukrainian ATC service to return to the take-off airport. T. Hypki reports that the Ukrainian ATC did not inform the crew of the Belarusian Boeing about the reasons for this decision, but threatened to intervene in the event of a refusal by military fighter planes. After landing, Armenian blogger Armen Martirosian was taken out of the plane. The Ukrainian side later denied that a threat of intervention by military aviation had been issued, and the Belarusian side upholds this version of the events [6, 16].

VII. Is it possible to legally shoot down a civil plane?

It turns out that it is, but not everywhere. After the attacks on the WTC in 2001, the "Concept of Operational Strengthening of Air Defense Against Terrorist Attacks MCM-062-02" was developed, where NATO for the first time defined the possibility of an attack using a civilian aircraft as a means of combat. A civil aircraft that could be used as a weapon was designated "Renegade". It can be classified as "suspected", "probable" and "confirmed". In the latter case, when there is an exceptional threat, it can even be shot down. An aircraft may be considered 'Renegade' if: a) violates an approved flight plan or changes flight parameters unexpectedly; b) refuses to comply or does not respond to orders of the state air traffic management unit, civil and military airport air traffic services units; c) cease all radio communication, especially in connection with a change in flight parameters; d) during radio communication, the crew uses unusual messages, deviating from standard aviation phraseology, or transmits messages not related to aviation procedures; (e) changes the codes emitted by the transponder, unduly uses the identification signal, emits loss of communication, emergency or hijacking codes or ceases to emit transponder signals without the approval of the state air traffic management unit; f) information from relevant services indicates the possibility of the aircraft being hijacked and used as a means of a terrorist attack from the air; (g) a terrorist organization or an unknown person has threatened to commit a terrorist attack using a civil aircraft [10, 12].
These principles were implemented by NATO countries, but in 2008 the Constitutional Tribunal in Poland found it inconsistent with the Polish Constitution, as it guarantees the inviolability of life and health protection for every citizen [15]. The Polish Constitutional Tribunal decided that in this case the principle of the "lesser evil" could not be applied, even if the destruction of the commercial plane with passengers would save the lives of even more people on the ground. This was taken as skeptical in the aviation community, arguing that the theoretical right to shoot down a hijacked plane was a good deterrent to potential terrorists. In the current situation, the Polish Air Force not only has no right to open fire to a civilian plane used as a weapon, but perhaps they are not even entitled to fire a warning series from a cannon, as it is a potential threat to the life and health of people on board the hijacked plane (and not only).

We should also remember about the possible risk of a collision between a civil and a military aircraft. The events of the past years indicate that this does not only apply to air incidents related to accidental violations of separation rules in

the air. Since Russia's occupation of Crimea, its relations with the West have become increasingly tense. In the second half of 2014, there were even provocative flights by Russian military planes, which could pose a threat to civil air traffic. Russians often fly without ICAO transponders turned on and without submitting ICAO flight plans, which is clearly an act of provocation. For example, on March 3, 2014, the Russian Il-20 approached the SAS airliner A321 over international waters 50 km southwest of Malmö. The planes passed just 90 meters away. In October 2020, the Russian Sukhoi Su-27 fighter approached and flew past the Israir Airbus A320 from the Greek island of Rhodes to Tel Aviv [26]. There were more such cases in the world.

SUMMARY

The cited cases of forcing civil aircraft crews to change their flight route and landing place show that air transport safety is highly dependent on political issues and international events. In some cases, the intervention of fighter aviation was used, in other cases, the mere threat of using the armed forces was enough to force the execution of their own orders on the crew of a civil aircraft. The examples given here may create a formidable precedent that may be repeated in future. The most effective method of eliminating this type of threat from air transport would be its complete separation from regions where even the smallest international disputes take place. In practice, this is either unlikely or not possible. This means that special secret services (intelligence), whose task is to detect threats and counteract such situations, must play a huge role in ensuring transport safety.

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