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PLEASE FASTEN YOUR SEATBELT

Increasing civil aviation safety

Thesis

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ABSTRACT

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Air transportation is considered as the safest mode of transport. In the face of many accidents and acts of terrorism that mass media are informing about, there are doubts appearing if that statement is reliable.

The aim of the thesis was to show the safety issues in civil aviation - current situation and gradual changes within the sector that lead to increased safety. It was divided into two sections – theoretical framework, which gave the theory over the topic and the empirical part – a survey conducted among the passengers of the Poznań-Ławica Airport. The author based the theoretical part on the online articles, the articles in journals, books, governmental statistics, a seminar presentation, secondary data research, official reports of the air crashes and many more. The empirical part was produced by the author as primary data and it shows passengers' attitude towards flying, their threats, their feelings about the security measures and the opinion about the Poznań-Ławica Airport.

The result of this project has shown a few things. The theory showed the importance of proper training of the employees working in the sector of aviation. It also presented the human factors as the main cause of the accidents and the aspect of the terrorism – actions undertaken to prevent it and its possible consequences in tourism and economy. To have an image which makes flying safe from entering the airport until receiving luggage at the destination, the author presents the instruments helping to provide that. For example: Instrument Landing System (ILS), Air Traffic Control (ATC), luggage systems and protection from the animals. Also the main organizations in aviation were introduced and so was the airport considered in research section.

Key words		
Airport, air, aviation, luggage, Poznań-Ławica, procedures, safety, systems, terrorism, transport, quantitative		

LIST OF ABBREVIATIONS

ATC   Air Traffic Control

DGR   Dangerous Goods Regulations

FAA   Federal Aviation Administration

FRMS   Fatigue Risk Management Systems

GASP   Global Aviation Safety Plan

IATA   International Air Transport Association

ICAO   International Civil Aviation Organization

LCC   Low-Cost Carriers

MTOM   Maximum Take-Off Mass

NTSB   National Transportation Safety Board

TSA   Transportation Security Association

USDOT   United States Department of Transportation

ABSTRACT

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1 INTRODUCTION

Air transportation plays a significant role in today's world economy. The contribution of the sector to the whole world's economy is great. It is equal to about 3,5% of the global gross domestic product which is about €1,61 trillion (Steele 2012.). It helps in carrying people and goods all over the world in just several hours. The world has become addicted to air transport – its growth determines the growth in many other sectors and vice versa - development of the other sectors helps in evolution of transport. As its role is great in today's world, one of the most challenging issue starting from the very first commercial flights is to make it safe.

As the topic of the thesis can be considered as a wide one, the author had focused on several chosen issues. However, the main aim of the thesis is to show the safety of air transportation, its possible future, weaknesses and strengths. To achieve that, each chapter is presents different issue.

The first chapter is to introduce the current situation in the sector of transportation – to give an overall view and show some examples based on secondary data research. The second one is to show the human factors and the role played in the safety of civil aviation. Thirdly, to present different factors that were causing the incidents or accidents and the actions undertaken as their prevention. In addition, the two main aviation organizations are presented. The reader can also find general information as well as the contribution on the level of safety and security. There are also chapters showing a few of the systems used at the airports which are meant to provide safe flights and passenger service. Another chapter shows the aspect of terrorism and its influence on today's situation in the sector. At the end of the theoretical framework part, the object of research is presented. Further chapter will provide basic information about the Poznań-Ławica Airport together with the

development plan and general contribution to tourism. To present the theory included in the first part of the report, the author used the articles dedicated directly to the air transportation topic as well as report of the accident that affected the whole sector and changed it in the last decade.

To support the theory presented in the first part of the report, the author also presented the outcome of research conducted for the needs of this project. To achieve that, quantitative research method was used. A questionnaire was distributed with the help of social media and focus groups. The target group was an average passenger of Poznań-Ławica Airport and the aims of the survey were divided into three sections. Besides the general information about the respondents, the questions dealt with the general perception of the aviation safety and also security measures and safety feelings at the airport with their evaluation.

2 THE CURRENT SITUATION OF THE AIR TRANSPORTATION INDUSTRY

The whole air transportation sector gives an opportunity for employment not only directly to the people involved in aviation. The secondary effect touches whole regions which develop the infrastructure, connections and marketing. Also, among 56,6 million employed directly in air transport, 58,5% work in on-airport premises excluding the airlines and the airport maintenance. The employees working directly in the aviation industry can get well-paid work with high skills trainings. (Airbus S.A.S 2013.)

The role of transportation is crucial especially for tourism. The number of arrivals has been constantly growing globally for the last decades. According to Duval (2007, 1-5), a big role in that sector's development was played by the airline industry development. It allowed some destinations to market themselves properly and to attract many investors and tourists to visit them. The Canary Islands can be given as a good example. Together with the development of tourism and the accessibility to flying, the number of arrivals has been rising constantly and in 2012 it reached 207% of the result of the year 1990 (Gobierno de Canarias 2013). When it comes to the overall picture of the sector, air traffic has been reaching a 200% result every 15 years even when the crisis (like the one in 2008) was touching the whole world's economy. According to the forecasts, the same result is going to reach the same level in the next 15 years (Airbus S.A.S 2013).

The growing demand for air travel has to be met by the service and freight providers. The environmental and social factors are also taken into consideration. The development made them reduce the noise and CO_2 emission respectively by 75% and 70%. To be able to fulfill the demand, the carriers needed to have more

capable aircrafts. That issue was changed by transport companies – the number of seats has increased by 25% in the last two decades. This trend is still current – carriers order bigger aircrafts like Airbus A380, which is the biggest aircraft ever made for the purpose of civil air transportation (Frank & Michaels 2007). The enlargement of the aircraft is only partly conducted as a result of the demand. The decrease of noise and mentioned CO_2 could be reached due to the bigger aircraft so that less units per passenger has been used (Airbus S.A.S 2013).

What has been important for the whole sector is that the price of the fare has not been increasing constantly. Such situation made it affordable for majority. According to Airbus, flying from Los Angeles to Honk Kong 72 years ago would cost more than a year's average salary. In 2013, it would take just a week to earn the sum equal to the same route. (Airbus S.A.S 2013.)

Showing the sector's contribution to tourism, in 2010 more than a half (51%) of international tourists were travelling by airplane. It not only helps to develop the whole industry but also allows to reach the attractive areas during the cold months, or which are situated in places difficult to reach unless air transport is available. These connections make today's society life easier also in the terms of lifestyle. The decision of going abroad for studying or for the purpose of working is easier with this number of connections, which stands for 26 717 000 aircraft movements in 2010. (Steele 2012.)

What is worth mentioning, is that the total percentage of the flow of goods transported by air stands only for 0,5%. When the total value of all the cargo is considered, then the rate is more than one third of all goods transported and stands for 34,6% (Steele 2012). It makes the flight security even more important. High value often means high importance and, as a result, higher service fee.

Air transportation is considered as the safest mode of transport. However, in case of fatal accident occurrence, the probability of surviving is very low. GRAPH 1. shows that the actual number of accidents with at least one victim is constantly decreasing and during an 18-year period it has been reduced by almost 75%. Thit statistical information allows the passengers hope that this trend will continue so that the technology development will make the air travelling safer. (Stols 2012.)
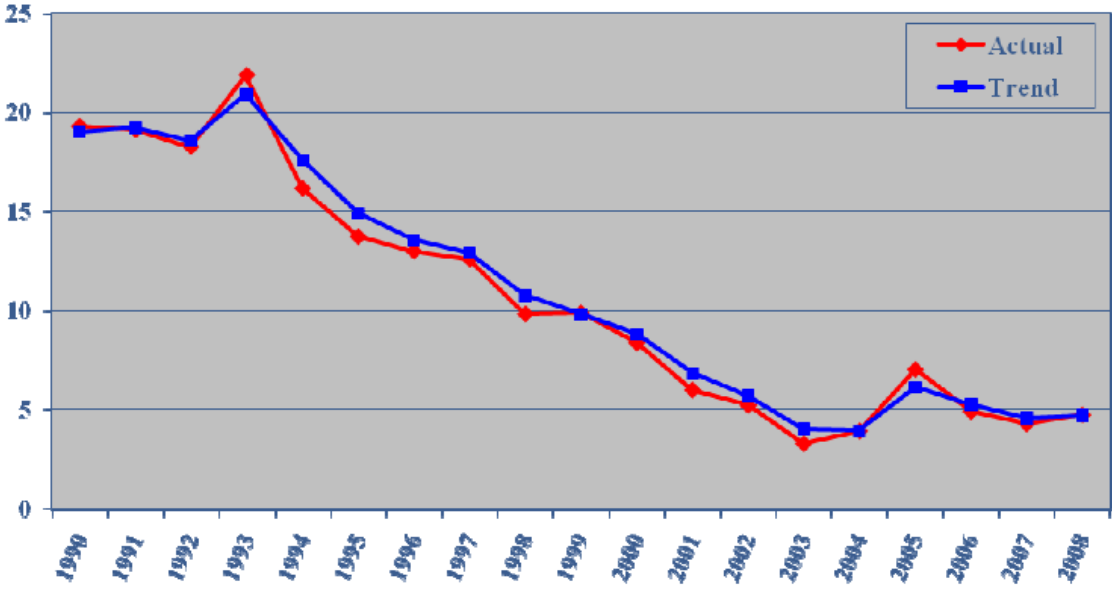
GRAPH 1. Fatal accident per 10 million departures. Passenger scheduled service for aircraft MTOM > 2500 kg. (adapted from Stols 2012)

3 HUMAN FACTORS IN CIVIL AVIATION SAFETY

Nowadays technology allows humans provide safe flights. While analyzing the statistics (GRAPH 2.), a clear trend can be concluded – people are still less reliable than machines. Paradoxically, every air crash or incident gives the new ideas, sometimes changes in regulations, law or routines that had been used at the airports, when the investigation revealed any relevant issues.
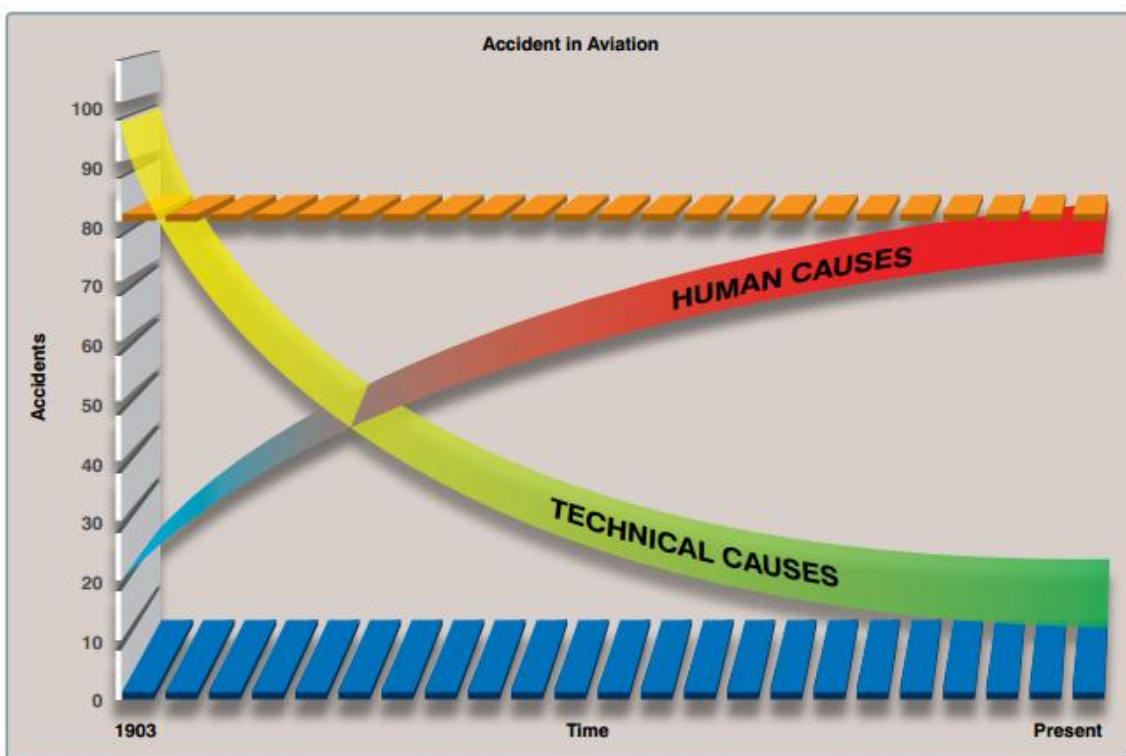
GRAPH 2. Relationship between human and technical factors in aviation accidents. (Adopted from U.S. Department of Transportation, Federal Aviation Administration, 2008.)

Since aviation requires appropriately qualified employees, there is no space for carelessness. In their hands there might be the future of hundreds of passengers who are subconsciously relying on their scrupulousness at work. The U.S. Federal Aviation Association (FAA), being aware of the problem of the maintenance

workers' fatigue, released a list of recommendations at the end of 2011 that had been presented and developed previously in March of the same year. The aim is to raise awareness so that air crashes can be prevented beforehand. The list includes actions such as including awareness permanently as a habit, introducing limits of hours worked and supporting the Fatigue Risk Management Systems (FRMS) in terms of maintaining the aircraft (Werfelman 2012).

A proper but tragic example is the air crash of the Air Midwest Flight 5481 in North Carolina in January 8, 2003. The lost control of the pitch and overloaded small aircraft caused the death of 21 persons on board. Investigation carried out by the National Transportation Safety Board (NTSB), has revealed some of the probable causes of the accident, among which all of them could have been avoided beforehand and none of them could have been prevented by the crew. The main mechanical reason was the failure of the maintenance team in the elevator control system, which was not noticed by the Air Midwest representatives nor the Raytheon Aerospace inspector. Another reason was the balance of weight on board and the balance itself. The assumption given by the FAA about the average weight per one passenger was too low. (NTSB 2004.)

That accident caused many changes that have been made after the report of NTSB was released. Some of the gradual changes in society that can be imperceptible or that could never be associated with the aviation safety caused the previously described air crash. The average weight of a statistical American citizen is growing, therefore the assumption of the average weight and safety margins were recommended to be changed by the report. Moreover, since that time the training for the maintenance team have been supervised in order to be more appropriate so the level of their service is higher, and the personnel is more aware of the consequences in case of failure to comply with their obligations (NTSB 2004).

Nowadays, with the rapid development of technology, people rely on machines. According to the Aviation Maintenance Technician Handbook, in present times, the human being causes eighty percent of the accidents in air transportation. Such a high rate (Graph 2, p.6.) has increased significantly since the beginning of aviation, quite the opposite of the technical errors causing the accidents (U.S. Department of Transportation, Federal Aviation Administration 2008a). It includes for example, the maintenance, pilots or auditors. Such a high rate, forces the management of aviation to change the rules, lower this statistics and follow the descending trend that occurs in technical causes.

After the period of intense accident occurrence at the turn of the 80's and 90's, the 'dirty dozen' was created – a list of factors that were possibly responsible for the errors committed by the maintenance teams responsible for the aircraft, including lack of communication, lack of knowledge, lack of teamwork, lack of awareness, lack of resources, lack of assertiveness, stress, pressure, norms, fatigue, complacency and distraction. (U.S. Department of Transportation, Federal Aviation Administration 2008.) The FAA created strategy for each of them to counteract their negative impact. Understanding the correlations between these factors and their share in reasons of the accidents is increasing the safety of the whole sector.

4 AVIATION ORGANIZATIONS

Together with the development of aviation, the need for standardization has appeared. In addition, the formation of the subsequent airlines led to the foundation of different organizations. This chapter presents two of these, each one representing different entity establishing them. This fact does not influence the actions ran by them, which are similar in terms of the providing safety and security.

4.1 International Civil Aviation Organization

International Civil Aviation Organization (ICAO) was created already in 1944 as an agency of the United Nations. Nowadays it brings together 191 members. The aims remain the same – setting standards, regulations and rules needed to keep orderliness within its structures and the industry in general. Safety and security is number on of the priorities of the organization. (ICAO 2011.)

To harmonize and standardize the information flow, ICAO has introduced 4-letter code for every airport. It normally starts from the letter of the country where it comes from, however there are many exceptions. Nowadays there are 4273 codes created by ICAO. (Kable 2013.)

The organization is constantly trying to develop the aviation industry. It runs different programmes at the same time in different fields. Changes that are agreed on are implemented in form of standards, procedures, practices or annexes. As an example, small changes can be introduced as an annex, deciding about the upper age limit for pilots in different types of services, for instance multi-crew flights.

Amendments come into force after certain amount of time, so entities under ICAO can rearrange their structures if needed. (ICAO 2011.)

Besides smaller and bigger changes in regulations, ICAO creates also development plans spread over several years. As an example, The Global Aviation Safety Plan (GASP) is the document supporting statutory objectives of the organization. To be more specific, there are three goals that the report attempts to outline. The first one is to prepare air navigation safety aims. The second one creates framework for the member states and regions to help them increase level of safety by standardization, collaboration, resources and exchange of information safety. The last one provides strategies and guidance for both small and large regions in order to achieve the objectives globally. (ICAO 2013.) That plan will work not only for the largest airports and airlines. It will go deeper, starting from small ones, as they represent significant percentage of all stakeholders.

4.2 International Air Transport Association

International Air Transport Association (IATA), unlike ICAO was created by entities representing airlines, with 57 members in the beginning. Nowadays, all of the 240 IATA's members state for 84% of the traffic in the skies. (IATA 2013.)

Such a large share in this market led to the situation where the organization was accused over anti-competitive behaviour. These accusations, revealed in 2003, concerned delivering scheduled information about the flight to the organization's members. Because majority of IATA's members are regular, scheduled airlines, many of the low-cost carriers have never joined it as their vision of providing services differs significantly. (Mills 2003.)

Similarly as ICAO, IATA has introduced codes which are corresponding to a particular place or airline. Airports and cities were given 3-letter code, for instance the city of Stockholm's code is STO. Since the capital of Sweden has a few airports in its surroundings, all of them have a unique code – the main airport of Stockholm, Arlanda has the code ARN. Airlines were given 2-letter codes, so many of them include also a number. The Hungary's Wizz Air code is W6. (IATA 2014.) Such simplification allows for shortening the time of information flow. Since codes often refer to the full name of the company and the airport, it is easy and intuitive to decode them for an average passenger who is not a frequent flyer. It also excludes misunderstandings caused by misinterpretation if the right code was used.

According to IATA (2014b.), safety is its number one priority. This paragraph shows of reaching it. Dangerous Goods Regulations (DGR) is one of the main programmes, recognized worldwide as it is the only one used globally in shipping goods. In form of the manual, it sets standards recognized and followed by airlines. IATA is in close cooperation with the governments and ICAO members. Working together provides better results and the unity of applicable laws. The DGR is released occasionally. The newest version came into effect 1st of January 2014 and it was the 55th edition. It provides user-friendly, complete reference in transporting goods through aircraft.

5 IMPACT OF TERRORISM ON AIR TRANSPORTATION

When the common problems with the air transportation security are considered, one of the main fears might be the act of terrorism. It is undoubtedly a worry for the security management. This chapter highlights the turning point in perception of terrorism in the aviation, its impact on tourism and the demand in air travelling as well as shows the problems at the airports nowadays.

5.1 The influence of 9/11

While searching for crucial information about terrorism in air transportation, it is impossible to overlook the topic of the World Trade Center and Pentagon attacks on the 11th of September, 2001. That was one of the most important events in the history of civil aviation. As a result of four hijacked airplanes, 2 973 people were killed and all 19 of the hijackers (Kean & Hamilton 2004, 311.).

The impact of that tragic day had to revolutionize the rules of providing security in the sector, both on the ground and on board. It has not only become much stricter to get into the aircraft but also the screening procedures have become more detailed. Many of the restrictions came into effect directly as the result of the attack. Among them there are the scanners of the whole passengers' bodies, limitation in the liquid taken on board (packed and marked in a special container), larger amounts of security guards at the airports, or checking the footwear. Some of these effects were introduced only in the USA, where the panic after the attack was greater than in other parts of the world; however, many of them were applied globally. An example of the improvements used universally after the 9/11 are the hardened, locked doors

of the pilots' cockpit throughout flight, or the training of the crew to prepare them for the case of hijacking. (Learmount 2011.)

Still, the effects of the 9/11 were many more than just changes in the procedures in the airline industry. To prevent possible future inconvenience or to ease the identification of the offenders, more monitoring equipment was installed in crowded places, such as train and bus stations, ports and of course at the airports. Some companies introduced cards for their employees not to let potential lawbreakers enter their premises. Many of the states of the USA suffered as a result of lack of tourists – in Florida, where about 40 000 of the workers are directly connected to the airline industry, almost twenty percent of them lost their job by the end of 2002. The whole American economy suffered significantly, even in Las Vegas' casinos the number of visitors decreased by around 50%. (Goodrich 2002.) Many trips were cancelled after the tragedy, thus depriving the revenues from transportation, services and goods that could be acquired by the tourists at the destinations.

That tragedy was a warning for many countries throughout the world. For the risk of the potential loss in economic matters, terrorism should be prevented at all costs and that is why safety management is one of the main issues when it comes to air transportation.

5.2 Airport measures

An airport is a place exposed to all kinds of dangerous threats. Ubiquitous rush makes it more chaotic so that good managerial skills are needed to take control over it. All the changes implemented until now have made the security procedures quite a popular topic to write about in mass media.

There is a great responsibility on the airports to arrange a safe luggage flow. Even though many of them are arriving safely, the history taught us to assign every luggage to a specific person who they can recognize easily. Moreover, the content of the bags has to be marked as non-dangerous. The air crash is normally preceded by many unfortunate circumstances. In 1985, the crew responsible for the security, police and other service, failed to detect the explosives in the luggage of the Air India flight, flying from Toronto to Delhi through London. As a result of the incompetence and inattention, all 329 of the passengers and the crew were killed (Vancouver Sun 2012). Still, until now it happens that the security fails to detect forbidden items. Recent seizure of almost one tone of the cocaine on the flight from Venezuela to France shows, that there is still a lot to do to fully protect the flights and the people onboard (Moores 2013).

To be effective in providing safety at the airport, a detailed analysis must be taken up by the administrators to reveal the threats, weak points, potential aims of the acts of terrorism or what the terrorists need in case of the attack. Awareness of the threats plays a crucial role in preventing the potential dangerous situations. Among the types of terrorism there are, for instance assassinations (often aimed at a particular person), abductions, taking a hostage, hijacking or cyber terrorism that can seriously undermine the computer systems globally. An analysis of the characteristics of clothing, behavior or the symptoms that can reveal a more than average stress can help in finding a potentially dangerous person. Moreover, the person suspected to be a part of the assassination plan can be observed in terms of the body language - avoiding eye contact, avoiding the security guards or the monitoring system, having his/her hands clenched in the pocket of trousers or intensified observation of some object. Even though the passengers might not realize the problem, behaving suspiciously can make them being observed by the security at the airport. (Sztucki, Gąsior, Zając & Szczelina 2011, 27-32.)

Security, being so suspicious at the airports make the passengers feel as potential assassins. After the Transportation Security Association (TSA) introduced the full body scanners in 2009, the security at the airport was able to see the image of the passengers' nude, to be able to detect a possibly hidden weapon. A public inquiry conducted at that time revealed that 61% of the respondents were against the new measures. Around a half of the respondents claims that the new procedures will not decrease the probability of terrorist attack and that the procedures are violation of their privacy rights. (Martin 2010.) It is a current challenge to compromise the safety provide and respecting passengers' intimate zone at the same time.

Some researchers do not believe at all in the effectiveness of the new device. Fred Cate from Center for Applied Cybersecurity Research, has sent a letter to the representatives of the United States Senate – Rockfeller and Hutchinson in which he points out why the new measures are not going to increase safety. For instance, the intrusive body scanning often does not work properly, it only gives a negative passengers' perception of it, whose intimate zone is often exceeded. The author of the article quoting the letter speaks directly of the measures, calling it a 'security theater' (Fallows 2010). There has to be a balance between respecting passengers and providing good quality, and safe service to let them travel as they expect. It is impossible to satisfy everyone, therefore there is still a long way to compromise these two issues so that they work properly simultaneously.

6 AIRPORT SAFETY SYSTEMS

Even though many countries have their own procedures when it comes to the airport measures, the variations are not big. For instance, European Union has introduced equal regulations applied to all the airports located within the borders of the EU members (European Parliament, Council 2008.). This chapter enlarges the information contained in previous section and describes more theoretically some of the systems supporting the safety at the airports regarding both passengers preparing for departing and the aircraft approaching the touchdown.

6.1 Luggage systems

To take control over the thousands of the passengers' travelling bags, the Baggage Handling System is used at almost every airport. To support that system, the Explosives Detection Systems (EDS) has become more popular. EDS is used mainly in aviation security but it can be also found in post offices where is also used to detect illicit materials. At the airport, that system is used to check the cabin luggage, checked luggage and all the cargo sent via air. (Singh & Singh 2003.)

The screening systems are becoming more and more precise. The factors that were forcing the changes were the attacks that were causing the fatal accidents. During the years 1985 to 1997, around 1100 people died as a result of the bombings onboard. As a result, screening the luggage and detecting forbidden substances became one of the major concerns in the commercial flights. (Singh & Singh 2003.)

The country that has one of the strictest rules of security control is the USA. By June 2006, there were 1600 of EDS and 7200 of Explosive Trace Detection (ETD) machines

installed at over 400 airports just in the USA. Feng et al. (2008, 618-627.) points out a few limitations of the systems, their use at the airports and shows rules of the luggage screening. This procedure takes place at two levels. The first one is about checking all the baggage available. If there are any circumstances that might reveal forbidden substances contained in the passengers' belongings, then it is to be send to the second level, where more detailed control is provided, thus minimizing the risk of smuggling illicit items or substances.

6.2   Instrument Landing System

The Instrument Landing System (ILS) is a standard introduced by ICAO already in the mid-twentieth century. Since that time, it was constantly improved in order to provide the biggest possible help for the pilots landing, giving both horizontal and vertical guidance for a safe touchdown. There are installations needed both on the ground – transmitter and localizer as well as onboard receivers. As a result showing the right position of the airplane with respect to the runway, starting from 6 to 11 km away from the airport. (Landing Systems 2012a.). GRAPH 3. shows the incorrect descending path of the aircraft, notifying that the airplane is unreachable for the transmitter's signal or that signal is weak. The glide slope should be between 90 Hz and 150 Hz at the lower altitude to have a normal descending.
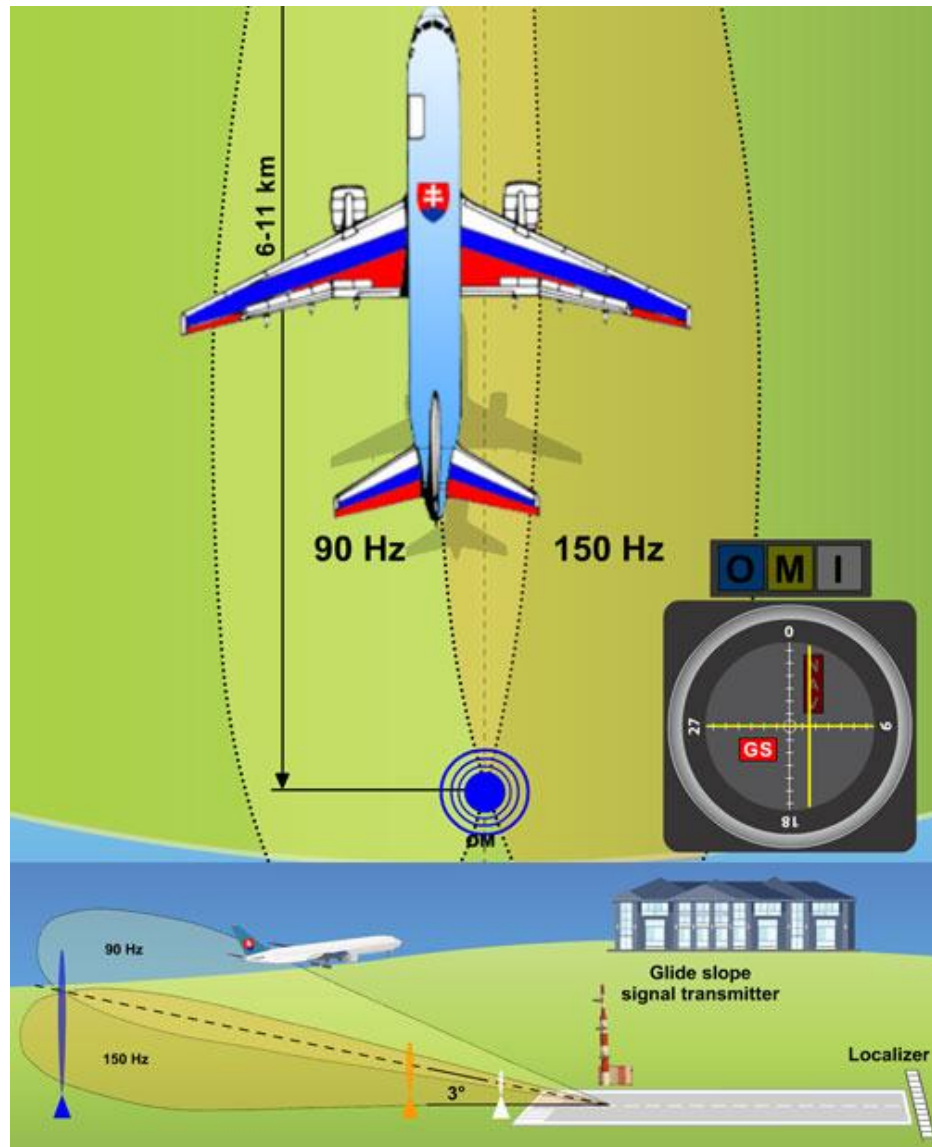
GRAPH 3. An example of the displayed GS pointer notifying a diversion from the glide slope, a too weak received signal, or an obstacle on the way (Adapted from Landing Systems 2012b.).

To show the importance of the supporting systems when the aircraft is going land, it is enough to give the practical examples of what can happen if there is no such system or where it is off. It is particularly useful in case of limited visibility but nowadays pilots rely a lot on the technologies available. On July 7th, 2013 one of the Asiana airliners have crashed at the San Francisco airport killing two passengers and injuring many more. It took place when the ILS was turned off due to the maintenance works which, however, according to the experts, not practiced

normally. (Henderson & Levine 2013.) The investigation will probably reveal all the circumstances later on but for now the first assumptions lean toward the lack of the system working at that time, which was jeopardizing the higher number of the passengers during the high season.

6.3 Protection from animals

The aircraft requires to have a clear way on the approach and touchdown paths. The history knows the cases of fatal accidents of as an effect of striking the wildlife already since the beginning of aviation, in the beginning of 20th century (Warsaw Chopin Airport 2012.). Based on the case of Warsaw Chopin Airport, this subchapter shows how the airports keep the glide slope and the airport apron clear.

The ways to achieve that vary significantly. In the main airport in Polish capital are for instance: hiring a falconer so that the falcon gets rid of the other birds, deterrence of the animals with firecrackers and other pyrotechnics (after getting authorization), frequent gardening work to prevent the emergence of the nests, controlling the conditions of the fence surrounding the airport (Warsaw Chopin Airport 2012.). For an outsider it might seem a bit trivial, however the issue of keeping the apron clean is crucial for the safety of the aircraft and in consequence for the people on board. As in many other fields of the air transportation safety, prevention is a top priority.

6.4 Air Traffic Control

Together with the development of aviation, there was a need to take control over more and more crowded airports. To follow that trend there was a need to create place from where it could be controlled. Thus, Airport Traffic Control (ATC) was created, which is in charge of providing efficient flow of the aircrafts and avoiding collisions at the apron and in the air. (U.S. Department of Transportation, Federal Aviation Administration, 2012.)

To meet the highest standards of safety, it is normally placed in the highest point of premises, so that airplanes can be in sight of the controllers. Nowadays even small, regional airports try to raise their own ATC Towers. The Poznań-Ławica Airport, which served 1,2 million passengers in first ten months of 2013 has also started to build its own tower. According to its president, that operation is crucial in terms of development (Gazeta 2013.).

To show the importance of proper communication between the ATC Towers and the airplanes, the disaster at the Tenerife's Los Rodeos Airport on 27th of March, 1977 will be briefly discussed. That day after bomb exploded at Las Palmas Airport, many flights were diverted to Tenerife. The unusual crowd, deteriorating weather (heavy fog was about to cover the airport), not enough staff at the control tower, technology poorer than today, stress and the rush caused the disaster. Two of the airplanes were about to leave the island. KLM Royal Dutch Airlines came untill the end of the runway, waiting for the early take-off, as the pilots could not extend their limit of working time. At the same time, another airplane, representing the Panam Airlines, was taxiing on the same runway, heading towards exit in order to let the waiting airplane go. Due to the foggy weather, the pilot overlooked one exit and instead of searching for exit no. 3, in fact he was approaching no. 4. Moreover, the

Dutch airplane started to takeoff without conviction that the runway was clear, which resulted in hitting the taxiing Panam's Boeing. (Freissinet, 2005.)

As a result of this tragedy, 583 people died and 64 survived, all from taxiing Panam's airplane (Freissinet, 2005.). That day showed the importance of visibility at the airports, confirming the information received from the ATC and importance of the technological solutions. Furthermore, readiness for stressful situations for workers under huge pressure who were lacking that Sunday in the ATC tower.

7 CONDUCTING A RESEARCH

The practical part of the report is about conducting a research among passengers of Poznań-Ławica Airport. This chapter explains the theory of conducting a research, presents the research objective and shows the results of the questionnaire.

7.1 Research objective

As the empirical part of this report is to get to know the passengers opinion about the Poznań-Ławica Airport, this subchapter will shortly present profile of the facility to give an overall picture of the place. The airport is located in western part of Poland between Warsaw and Berlin. This fact makes it extremely difficult to compete on the market. Even though Poznań-Ławica has been celebrating its hundredth anniversary of establishment in 2013, the last few years it serves around 1,5 million passengers each year, what in comparison to the busiest Polish airport in Warsaw (around 10 million) seems pale (Urząd Lotnictwa Cywilnego 2013.).

TABLE 1. Total passenger traffic at the Poznań-Ławica Airport (adapted from Poznań Ławica Airport Ltd. 2014a.).

2013	1 355 330 passengers
2012	1 594 934 passengers
2011	1 384 323 passengers
2009	511 097 passengers
2007	98 688 passengers

Competition grows fast together with the development in aviation so that many airports have been opened. Poznań-Ławica Airport takes the steps now to get as many passengers as possible. Table 1. shows the number of the total passenger

traffic, which has increased incredibly during the last years. Between 2007 and 2013 that number has grown by 1353,1%. Still, many other airports are growing so that new ones are needed. There are a few examples but the most spectacular in Berlin Brandenburg is postponing its opening constantly. The closed and unused airport is generating huge loss, up to €160 000 per month due to corrections, electricity and security. (Spiegel Online International 2013.)

As it was presented in subchapter 6.4, the development plan of Poznań-Ławica Airport consists of several points. Among the most important objectives there are the new ATC tower, new taxiway, newly opened arrival hall and in the near future also the transformation of actual complex terminal into departure hall. Together with the investments conducting, the Airport's management decided to lower charges for the carriers in order to encourage them to open new connections. For the most loyal partners higher discounts will be provided. (Poznań Ławica Airport Ltd. 2014b; 2013). Such encouragement was needed as using this airport before was uneconomical regarding many destinations, thus many of them until now have been available only seasonally.

When it comes to the safety aspect, the official website of the airport offers an especially prepared feedback form, in which everyone can report potentially dangerous situations or just leave a comment or a suggestion. There is a possibility to choose between different sections of the facility, time and date of danger with description of the incident. Optionally the contact information can be left and the witnesses can be pointed out. Many passengers who travel can use this system and help in improvements at the airport. Potential dangerous situations or places that need improvement can be easily overlooked, so an optional confidential platform of informing is a good solution.

7.2 Methodology

The empirical part of this thesis needs a word of explanation. This chapter will present the methods used by the author to conduct the research. The author decided to reach it by distributing the questionnaire, which is a quantitative research method. The main aim is to get to know the feelings of safety of the passengers of Poznań-Ławica Airport, their overall opinion about the safety in aviation and this particular airport itself.

According to Smith (2010), there are various ways to reach the respondents, including different personal distributions, telephone interviews, self-completion questionnaires, web based surveys etc. For the purpose of this project, the web based questionnaire was chosen by the author. Distribution via the internet can provide greater than expected size of sample. Also, the aspect of logistics is important so the web survey can be distributed through different channels such as social media and focus groups. All of the potential respondents will be able to fill it in their own time. Further sharing of the questionnaire can differentiate the sample and increase the number of responses. (Smith 2010, 77-88.)

The problem that the survey can face is the fact that it only needs the users of Poznań-Ławica Airport. What is more, they have to be participants of the focus group and check the social media sites. That can influence for instance age of the respondents, as younger people tend to use the electronic devices more often and their point of view can be different from another age group.

According to Veal (2006, 3-5.) there are three types of research. Each one is suitable for different research project. The ones that are pointed out are descriptive, explanatory and evaluative research. For the purpose of the thesis, the survey is connecting two of these: descriptive and explanatory. Questions in the survey are

helping to describe some phenomena that can be observed and the changes occurring in this field. Beyond that, the research tries to explain why the answers are how they are.

Validity is the extent until which data presented is the truth and reflects the actual state. The questionnaire has to be well constructed so that it does not give inappropriate scale or does not indicate which answer should be given as the survey could be accused of being biased. A good research is also reliable, meaning that carrying out the survey once more would give the same results. (Veal 2006, 41; 271.)

To sum up, there are many factors that need to be taken into consideration when such project is conducted: well-structured, neutral questions, large amount of respondents, representatives of different age groups and suitable length of the questionnaire. Appropriate attitude towards the research can give a rational outcome, just like every project should be done.

7.3 Results

This chapter will present all outcome from the questionnaire. It was divided into three sections and each one is intended to get information about something else. First one was information about respondents, the next one was checking their attitude towards flying and its safety and the last chapter, their opinions about Poznań-Ławica Airport. Thus, the author needed to distribute the questionnaire only among people who ever used the services of that airport.

With the help of the Internet, survey was distributed in the focus groups and social media and in just 48 hours from posting it, the minimum number of 50 properly

filled out forms was reached. While reporting, there were 62 answers that will help in analyzing passenger's feelings and behaviours.

From the technical side, answers were gathered in Google Forms™, which is a free tool helping in conducting a research. After gathering answers, they were transferred from Microsoft Office Excel file into IBM SPSS Statistics Data Editor.

7.3.1 Information about respondents

As in almost every questionnaire, the first few questions were simple and short, so that it could be found out who is the average respondent. In the survey, there was a small disproportion in gender of the respondents and more than two third were male. Only around 29% of the answers were sent by women (Table 2.).

TABLE 2. The gender of the respondents.

1. Gender

		Frequency	Percent
Valid	Male	44	70,97%
	Female	18	29,03%
	Total	62	100,0%

Second question checked to which age groups do participants belong. There was no need to share the exact age so there were 7 groups in total: less than 18, 18 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64 and 65 or older. Graph 4. shows that among 62

respondents, there was no one under 18 years old and no one who was 55 or more. Dominating age group was between 25 and 34 years. As expected, such numbers are not surprising since older people tend not to take part in focus groups and social media.
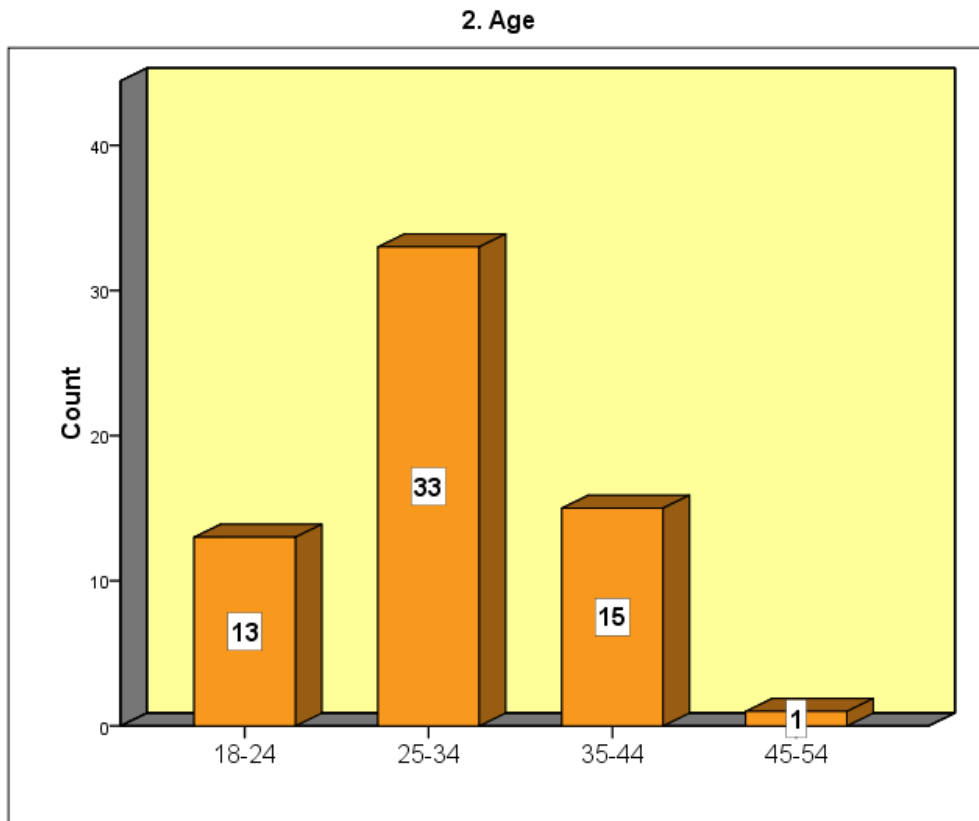
GRAPH 4. The age group of the respondents

Next information about the respondents was their place of living (Graph 5.). There were 5 options to indicate the size of the place of living. Vast majority chose the city of more than half a million inhabitants. Thus, it can be assumed that most of these respondents are from Poznań. The rest, less than 18% in total, indicated smaller places, like countryside (4 answers), town up to 15 000 citizens (3 answers), city of 100 000 to 500 000 citizens (2 answers) and town between 15 000 and 100 000 citizens (also 2 answers).
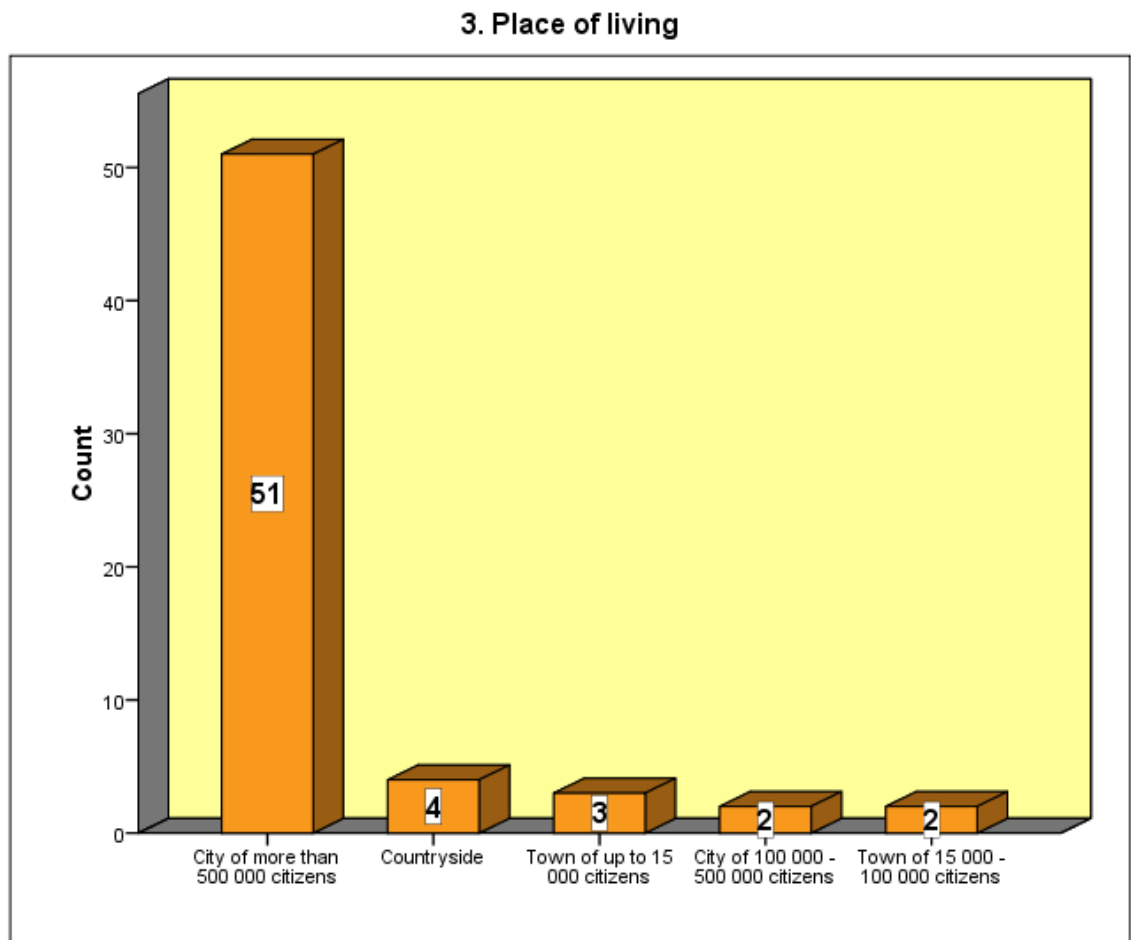

GRAPH 5. Place of living of the respondents.

The following question was checking the most common purpose of travel (Graph 6.). More than 3 out of 4 respondents were mainly flying due to leisure. Second most popular answer was work, with almost 18%, which is equal to 11 respondents

choosing that one. This can be understood as business trips and departing for seasonal or long-term work abroad.

Even though the question was general, without focusing on a particular airport, these answers could be different if respondents were asked the same question about Poznań-Ławica Airport. Due to poor connection network, there is a significant difference between number of passengers travelling and destinations offered between the high and the low season. Carrying out the survey at the airport during the low season could also give different image of the travelers.
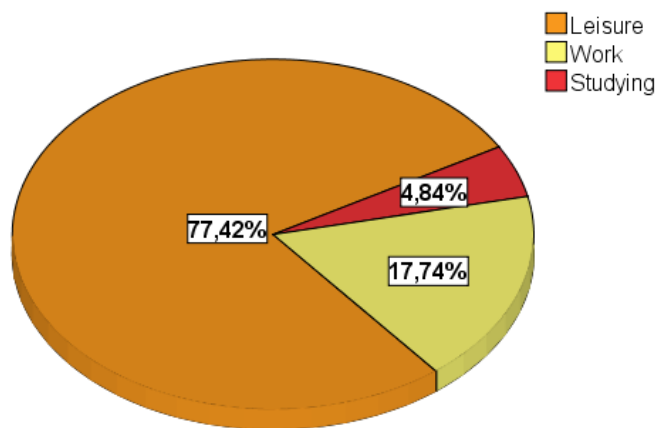
GRAPH 6. Purpose of travel.

Graph 7., on the next page, presents the frequency of using Poznań-Ławica Airport per year. There were four categories of choice: less or once, 2 to 4 times, 5 to 10 times and more than 10 times per year.

Luckily for the results of the questionnaire, the first option was not the most common one. Since many questions were concerning safety issues in a particular place, that was an important sign that most of the respondents (almost 73%) were using the services of that airport 2 or more times per year and only 17 of them (27%)

were using it rarely – once a year or less. These answers of frequent flyers can be considered more valuable as those respondents are often observing how the place works, does it change for better and how do security measures change.
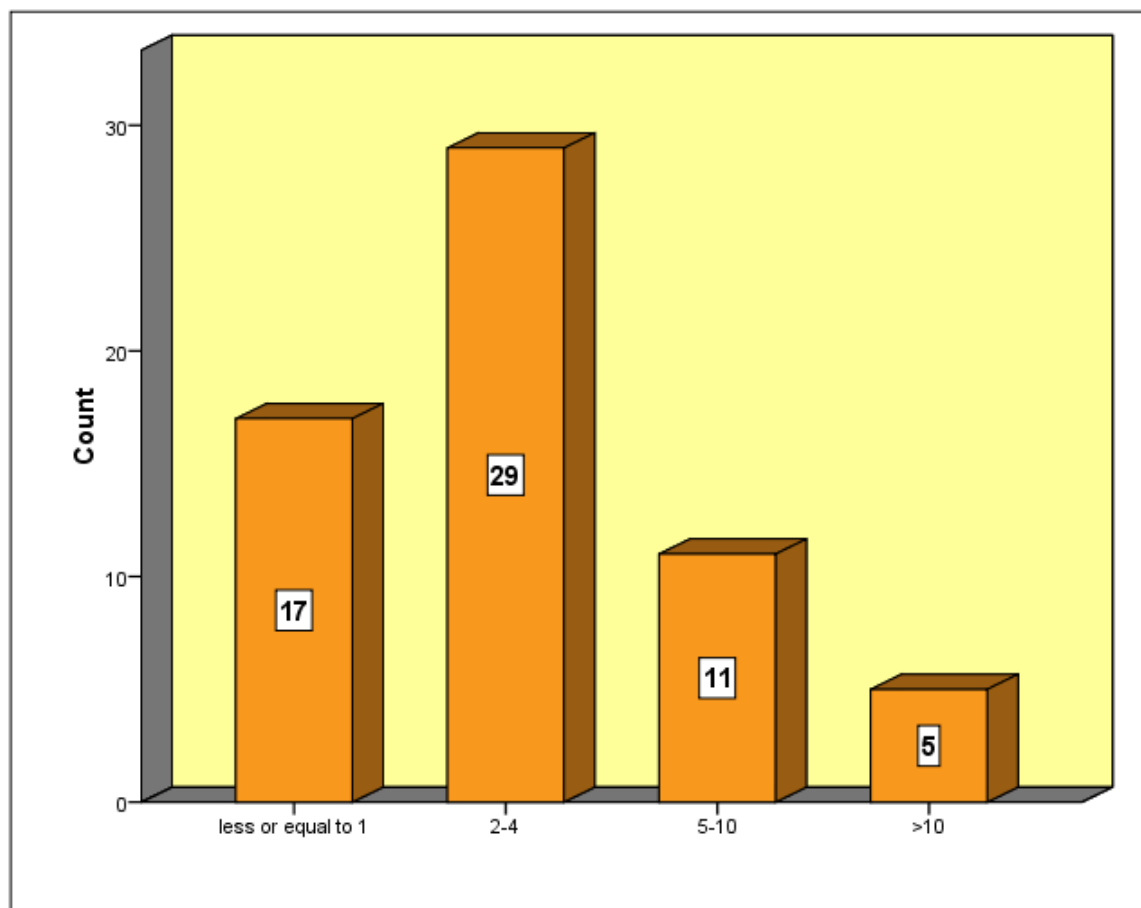
GRAPH 7. Frequency of using Poznań-Ławica Airport per year.

The next question checked the most commonly used type of carrier. Among three main types: regular airlines, low-cost carriers (LCC) and charters, the most frequently used was low cost (Table 3.), standing for more than half of the answers. As LCC offer the cheapest flights on the market, many buyers tend to fly for cheaper price rather than choosing comfort of their journey. Second most popular answer, chosen by every fourth respondent, was regular airlines. Charter flights were least popular option, chosen by 10 respondents.

As the Table 3. also presents relation with purpose of travel. It can be noticed that regular airlines are used mainly for business purposes. There is another strong trend with another two types of carriers: charters and LCC are used for leisure in almost all the cases, both equal to 90% or more.

TABLE 3. Type of carrier used most frequently.

	1 Leisure	2 Work	3 Studying	Total	Percentage
1 Regular airlines	5	9	2	16	25,81%
2 Low-cost carriers	34	1	1	36	58,06%
3 Charters	9	1	0	10	16,13%
	48	11	3	62	100,00%

7.3.2 Measuring the attitude towards flying in terms of safety

After getting the profile of the survey participants, the second section intended to measure their attitude towards flying in terms of safety. First, the very short question was obvious – there was a need for knowledge whether respondents are afraid of flying or not (Table 4.). Almost every fourth respondent indicated that there is some kind of fear while flying.

TABLE 4. Fear of flying.

	Frequency	Percent
Yes	15	24,2%
No	47	75,8%
Total	62	100,0%

Next two questions were not compulsory for those who marked that they were not afraid of flying, however some of the respondents answered them as well. Now, the task was to get to know what causes such fear (Graph 8.), by choosing maximum of 2 answers given. More than 19 percent of those who answered stated that fear of air crash was the factor causing their threat. Secondly, fear of the turbulences and bad weather, was chosen by almost 13%. Slightly more than 8% of the respondents were afraid of being dependent on other people's competencies. Next, possible terrorism act and no possibility of controlling the aircraft got the same amount of answers and stands for 6,45%. Only one person indicated a kind of phobia, which is understandable; the real, inner fear would not let anyone to become a frequent flyer.
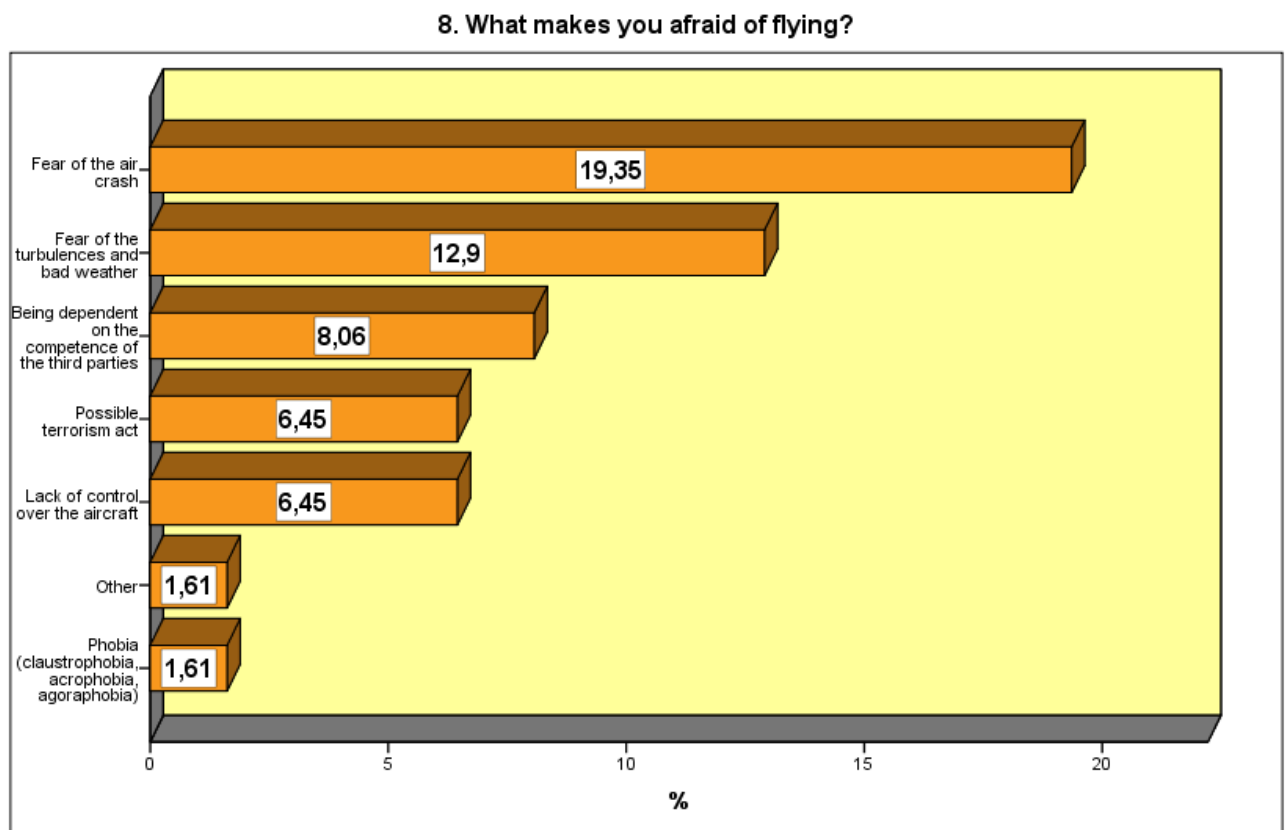
GRAPH 8. Factors causing fear of flying.

The following question checked what factors can influence the feeling of safety while travelling (Graph 9.). Among respondents who are afraid of flying, almost

every fifth sleep to feel safer (or not to feel the fear). Over 11% is trying to distract themselves in different ways, for instance with onboard entertainment or own devices (majority of those who are trying to distract themselves indicated that are most frequently flying with LCC, which are not offering entertainment during their flights). 8% is trying to drink alcohol to release from stress and almost 6,5% takes night flights, when it is usually calmer, lights in the cabin are off and it is difficult to see the altitude of the current position. One person suggested also sedatives as a form of overcoming stress. What is interesting, the same respondent was the only one who stated that some form of phobia is causing her fear of flying.

9. Is there anything that could make you feel safer while travelling?
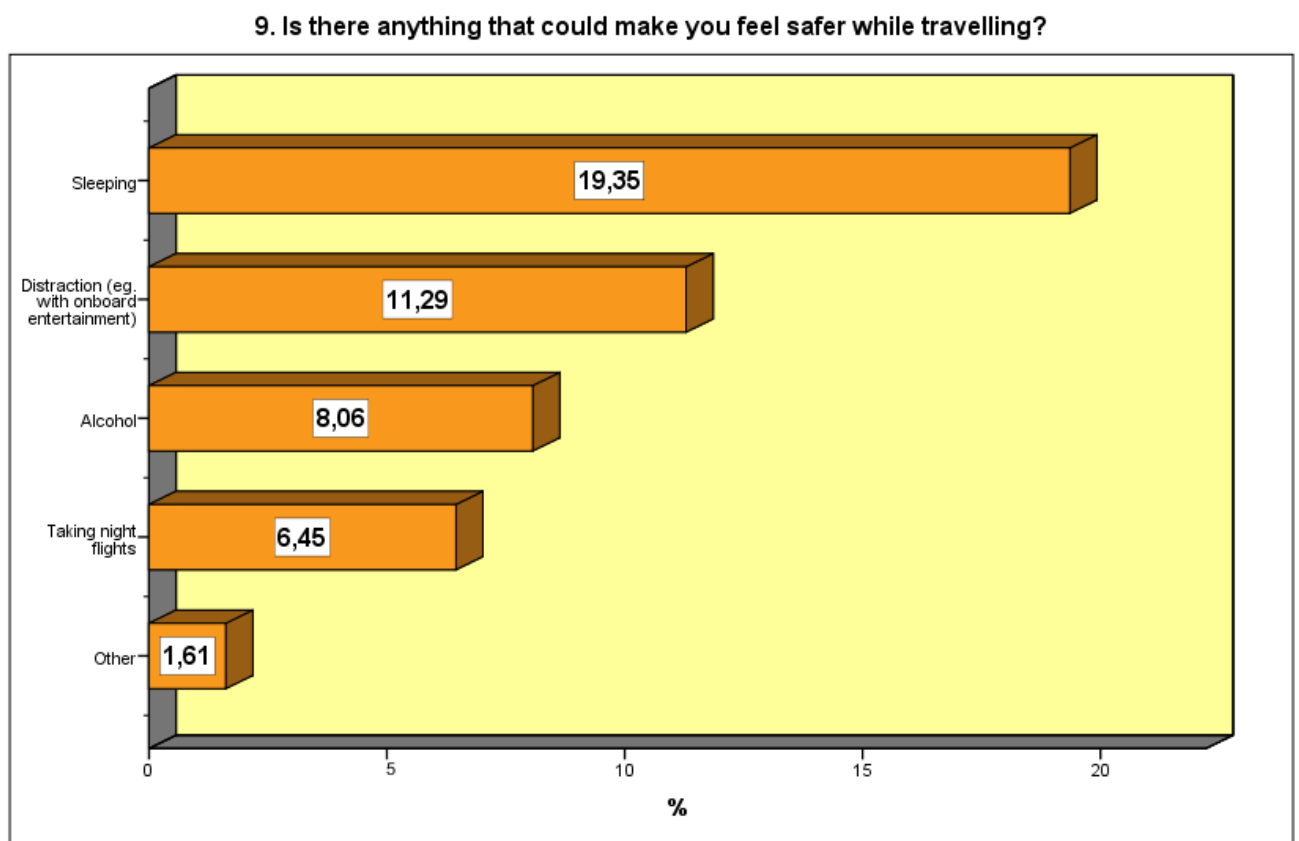
GRAPH 9. Factors making passengers feel safer while flying.

The following four questions were statements to which respondents were asked to respond by choosing between: strongly agree, agree, hard to say, disagree and strongly disagree. First of these checked if the respondents considered airplane as the safest mode of transportation (Graph 10.).
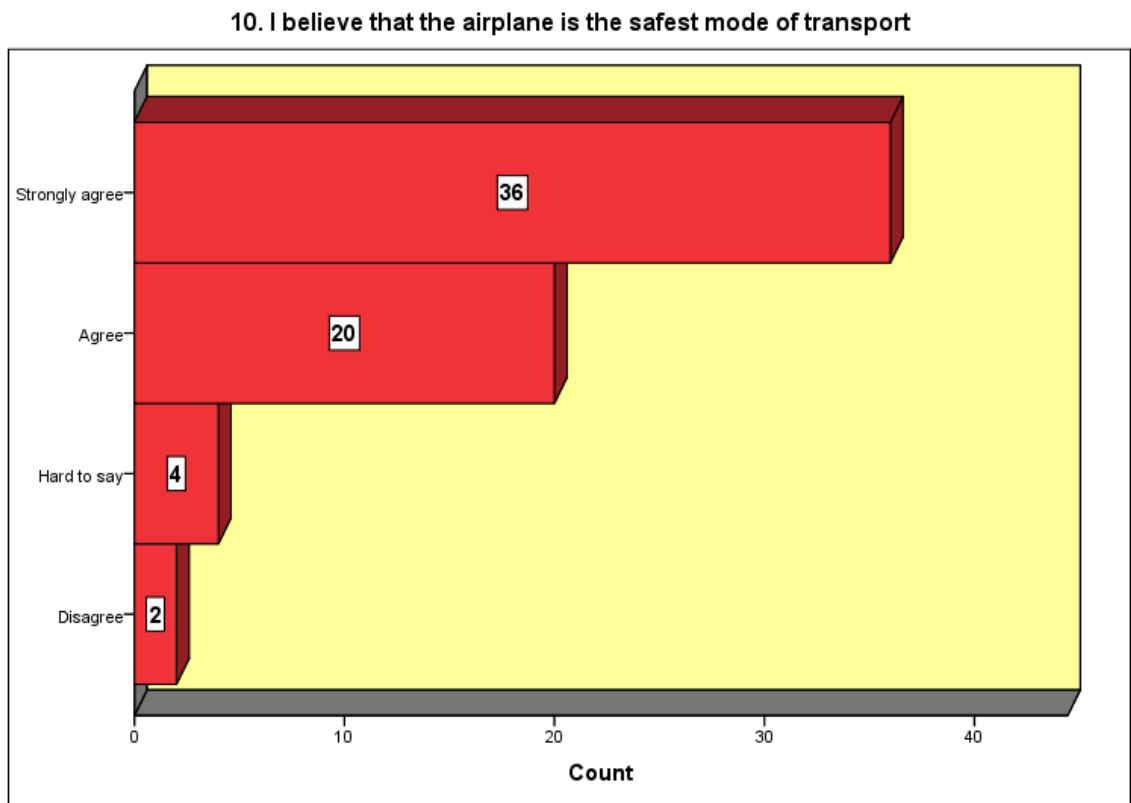
GRAPH 10. Airplane as the safest mode of transportation.

More than half of the respondents have strongly agreed. If both positive answers are summed, it stands for over 90% of all the answers. In comparison with Table 4., where the fear of flying was checked (24% stated that they are afraid of flying) it can be concluded that even though some of the passengers are afraid of flying, the common belief that it is the safest mode of transportation is another factor helping to fight the stress of travelling by plane. Four of the respondents could not decide in this question and only two of them disagreed. None of them strongly disagreed.

11. Greater safety feeling would let me travel more often.
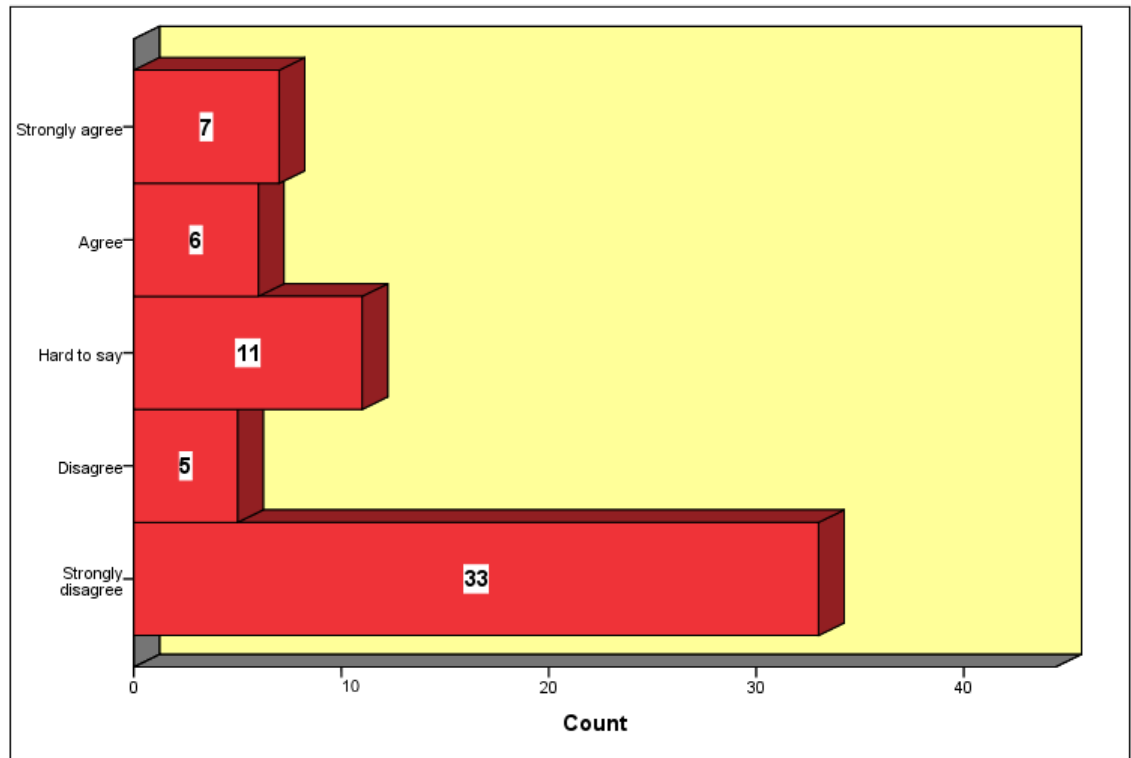
GRAPH 11. Greater feeling of safety as a reason to travel more often.

As it can be seen from Graph 11., more than a half strongly disagree with the statement, that greater safety would make them travelling more often. Only around 21% agree or agree strongly. Such effects are not easy to assess and these are rather long-term, so almost 18% could not choose an option. The conclusion is that passengers prefer to get to their destination fast and cheap rather than spending a lot of time and money and be safer. Since most of the respondents travel with LCC, such result cannot surprise.

12. Detailed passengers control can prevent potential dangerous situations.
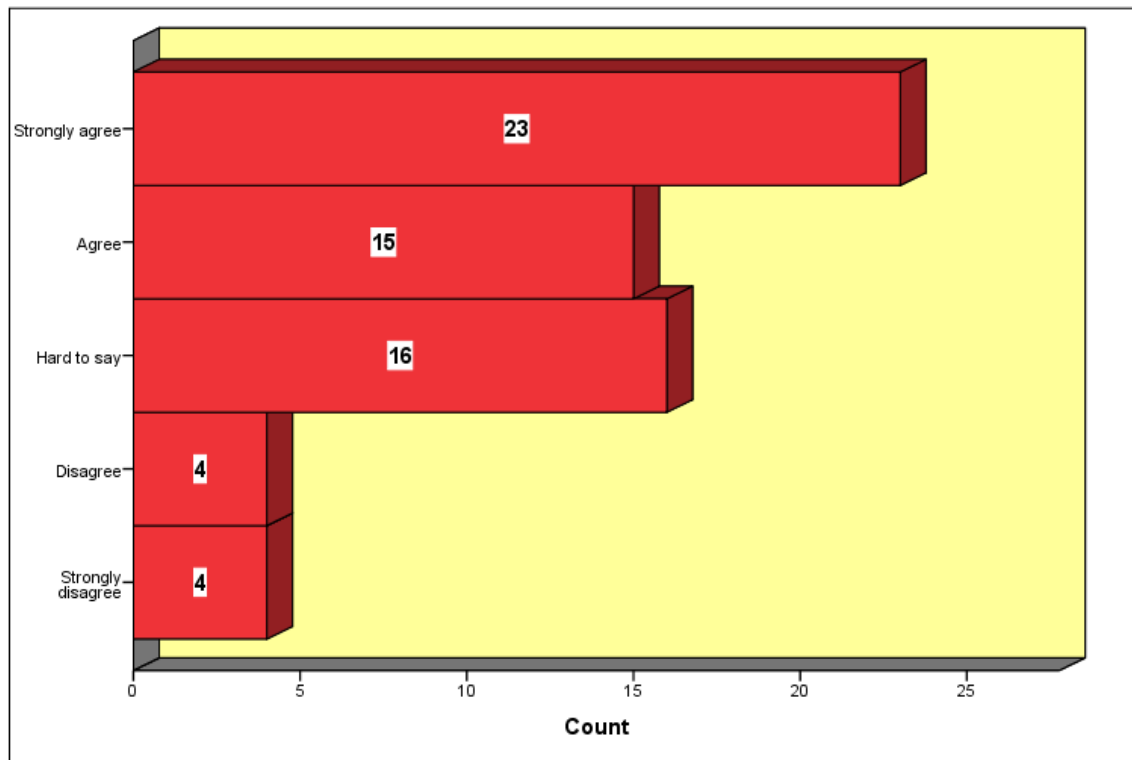
GRAPH 12. Detailed passenger control and the prevention of potentially dangerous situations.

The next question asked in the survey was aiming to get passengers' opinions about preventing dangerous situations at airports (Graph 12.). As the previous chapters prove, the number of incidents is constantly decreasing due to new security and safety systems. Yet, there are still situations where they just fail and an unwanted passenger, item or luggage gets inside the plane.

61% of the answers, which correspond to 38 respondents, agree or strongly agree with the statement. Only 13% (8 respondents) does not agree or strongly disagree with it and don't believe that it can fully protect them from danger. Many of the survey participants could not insist on any side and it was the second most popular answer.

13. Rules of items prohibited after security control are too strict.
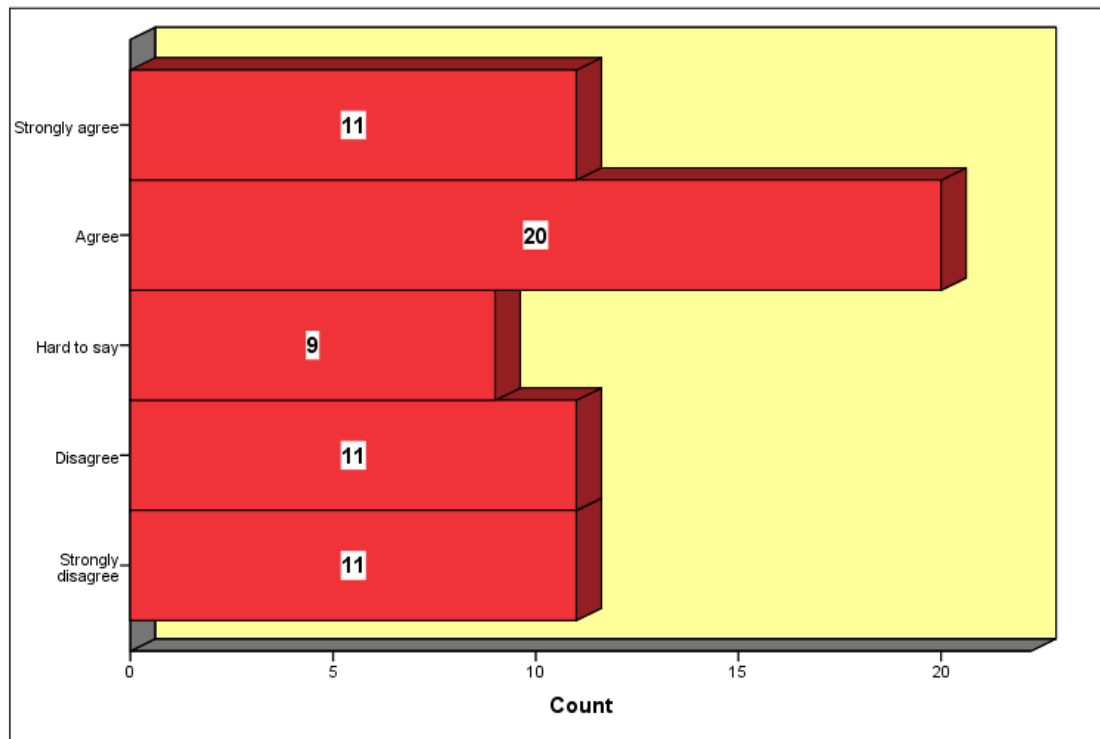
GRAPH 13. The strictness of the rules of items prohibited after security control.

Question number 13 in the survey was another statement (Graph 13.). Participants were asked if in their opinion, the rules of items they can have with them after security control are too strict. Opinions were divided almost equally between four answers. However, 20 of the respondents agreed and that answer was picked most frequently. For 9 of the respondents it was hard to choose an option. 33 respondents (53% of all) spread equally between options 'strongly agree', 'disagree' and 'strongly disagree'.

Since in the previous question respondents mostly agreed on the significance of a detailed passengers' control, it seems that they should consequently agree that the rules of going through security control are just right. This question's result goes along with that logic.

7.3.3 Safety at Poznań-Ławica Airport

The next part of the survey was already concerning Poznań-Ławica Airport. Respondents were asked about their safety feelings there, experiences from their journeys through open questions, comparisons with other airports and assessment of the facilities themselves.

14. What could according to you increase the safety of passengers on the ground? Choose max. 2 answers.
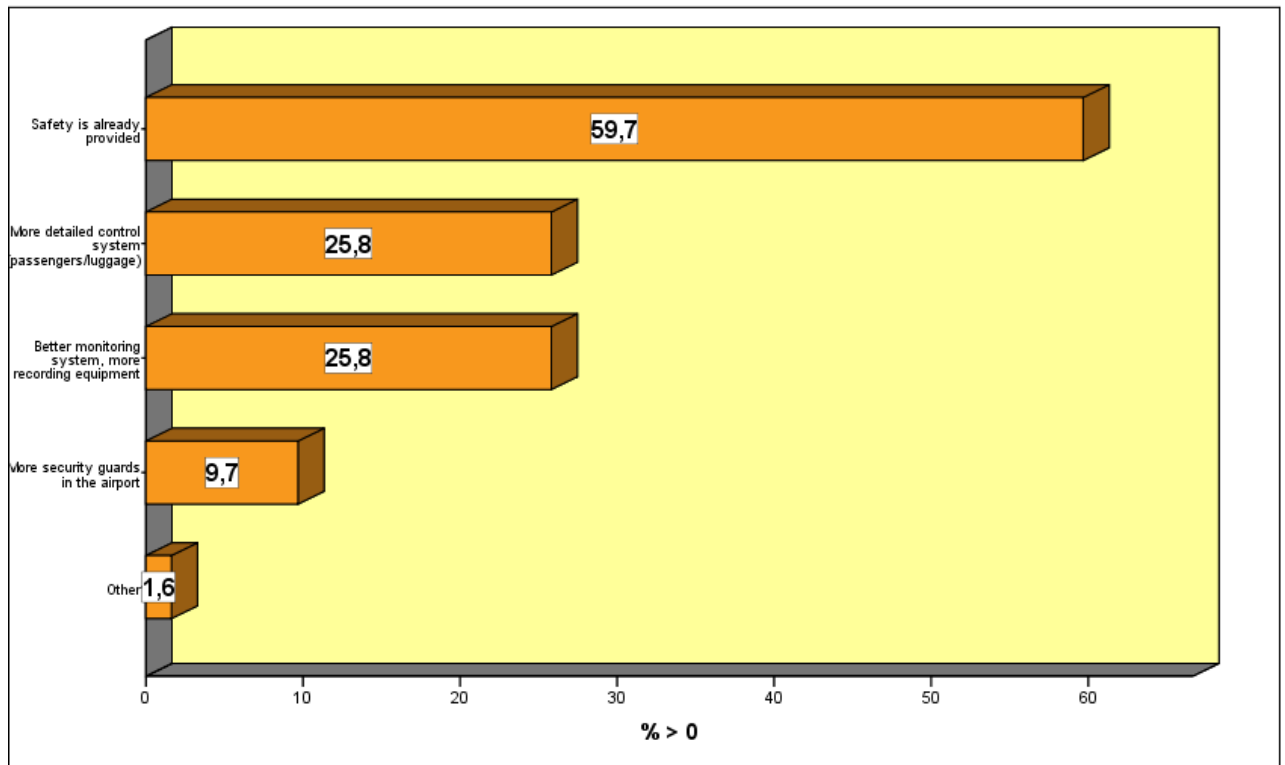
GRAPH 14. Things which could improve safety at the airport.

First question in this section was about general safety at the airport and factors that could improve it (Graph 14.). Participants of the survey could choose maximum of 2 answers. Among answers given, there were: 'more detailed control systems', 'better monitoring system and more recording equipment' (both 25,8%), 'more guards at the airport (nearly 10%) but the most frequently chosen answer was that the airport is already safe. One respondent suggested changing guards from Airport Security Service to a regular security company.

15. What are the things you are afraid of at the Poznań-Ławica Airport? Choose max. 2 answers.
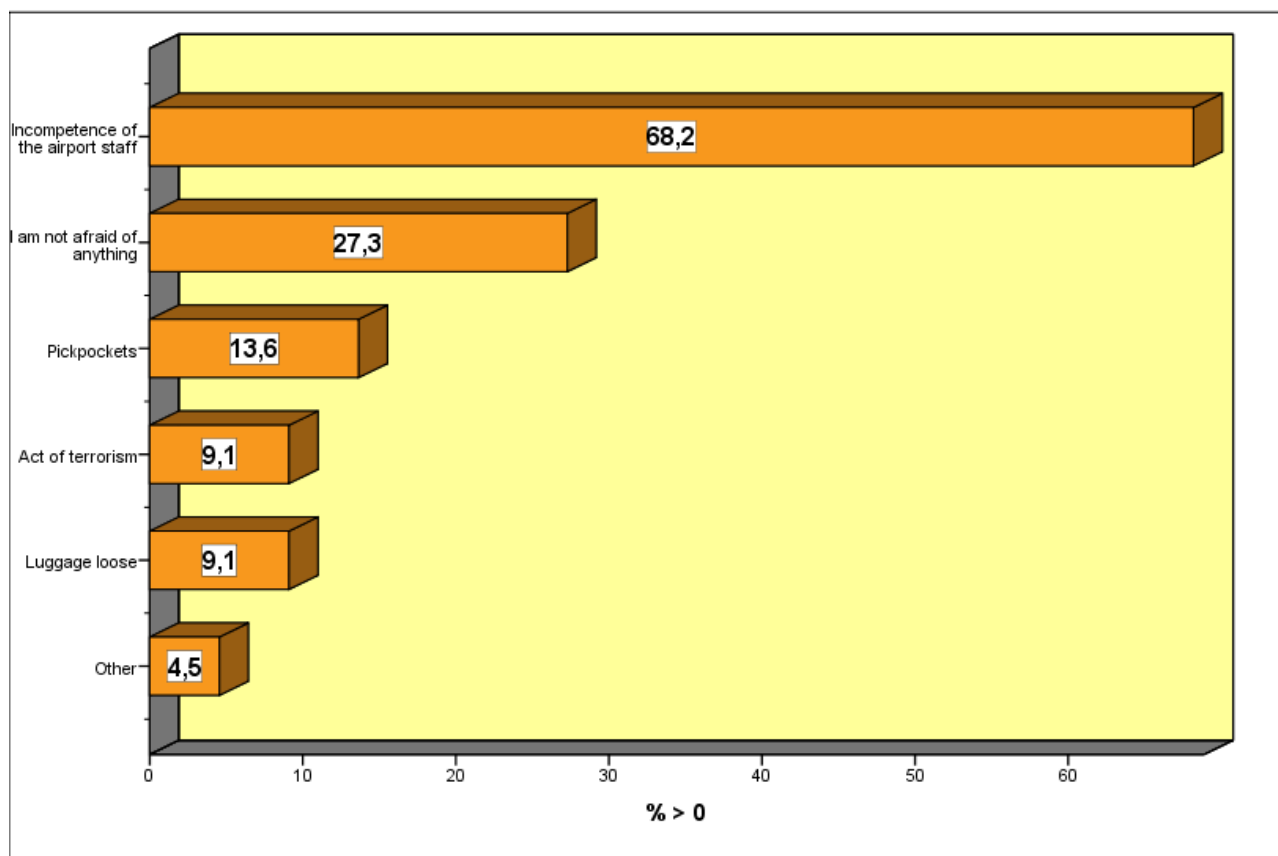
GRAPH 15. Passengers' threats at Poznań-Ławica Airport.

Graph 15. shows the answers for the next question – checking what are the things that the passengers are afraid of. Unlike the next question, denying answer was not the most popular one. Unfortunately for the airport, the most frequently chosen answer was the incompetence of the airport staff with 68,6% of the answers. More than every fourth does not have any threats. Pickpockets were indicated by 13,6% of the participants, which was the third choice of the respondents. Act of terrorism and loose of the luggage were picked by 9,1% both of the respondents.

16. How would you assess the security measures at the Poznań-Ławica airport?
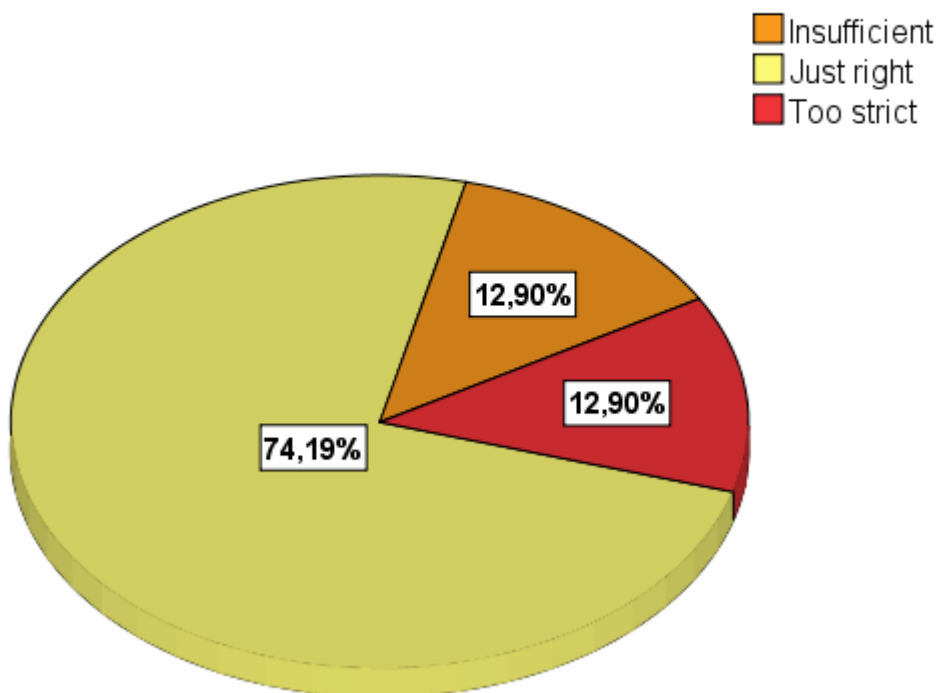
GRAPH 16. Assessment of the security measures.

Next issue taken up by the survey was to check how passengers assess the security in Poznań's airport. In scale with three different options: insufficient, just right and too strict (Graph 16.), almost 3 out of 4 respondents answered that these measures are just right. Two other options got the same result, equal to 12,9%. As in Graph 14., it confirms that majority is content with the safety level and those measures are satisfactory.

TABLE 5. Exceeded intimate zone.

		Frequency	Percent
Valid	Yes	7	11,3%
	No	55	88,7%
	Total	62	100,0%

Many of the respondents complained about the staff of the airport when had been asked about their threats. Next three questions considered security service employees' attitude towards passengers and respecting their privacy. First of these (Table 5), checked if the respondent's privacy had been exceeded in the form of exceeded intimate zone. 7 out of 62 marked 'yes', which corresponds to 11,3%. Moreover, according to Table 6., 5 respondents (8,1%) stated that they have witnessed when someone else's intimate zone has been exceeded. Even though the numbers seem to be low and the problem might seem marginal at first, the privacy of over 11% of the participants was violated.

TABLE 6. Testimony of seeing someone else's privacy being exceeded.

		Frequency	Percent
Valid	Yes	5	8,1%
	No	57	91,9%
	Total	62	100,0%

Those who have witnessed such violations were asked to describe them. Among these stories some direct examples right from the security control could be found. They prove that it is not only a sporadic accident; passengers notice that such situations tend not to take place in another airports.

> *"An older man had a bandage around the chest with some metal elements. He had to take off his shirt, what has surely been embarrassing for him."*

> *"Every touch and checking what I have in my pockets is a violation of my privacy. Sometimes I am lucky and I get checked by woman, at least I can feel a bit better."*

> *"It is derogatory to be touched on my feet by security service (it is a physical contact). I have not experienced that in other airports, loosening of these procedures would be nice."*

> *"Within hand luggage check I had to open my small box with contact lenses.*
> *In foreign airports (German, Swedish) it does not happen."*

Even though respondents are satisfied with the safety level at Poznań-Ławica Airport, when asked if using services of another airport would change their feeling of safety (Table 7.), 18 of them (29%) answered yes. Result can be also influenced by common opinions about security service which reflects in above-mentioned stories and previous graphs.

TABLE 7. Using other airports is making passengers feeling safer.

		Frequency	Percent
Valid	Yes	18	29,0%
	No	44	71,0%
	Total	62	100,0%

The following, short yes/no question checked if passengers consider other airports to be better. More than 69% (43 answers) responded yes. Such result cannot surprise after summary of the questions so far. Yet, the result can be influenced by the fact that presumably most of the respondents are living close to Poznań.

TABLE 8. Respondents considering other airports to be better.

		Frequency	Percent
Valid	Yes	43	69,4%
	No	19	30,6%
	Total	62	100,0%

Those who answered yes were asked to list some that in their opinion are better. It was not specified under what condition it should be compared but many of the respondents have added information that they list airports which are about the same size. Among Polish airports there were Gdańsk (GDN) and Wrocław(WRO),

from bigger ones: Warsaw(WAW), Frankfurt (FRA), Berlin-Schönefeld (SXF), London-Stansted (STN) or Dublin (DUB).

21. If yes, why? (Choose max. 2)

Better facilities	49,2
Better attitude of the employees towards the passengers	29,5
Better opinions	24,6
Better security	14,8
Other	11,5
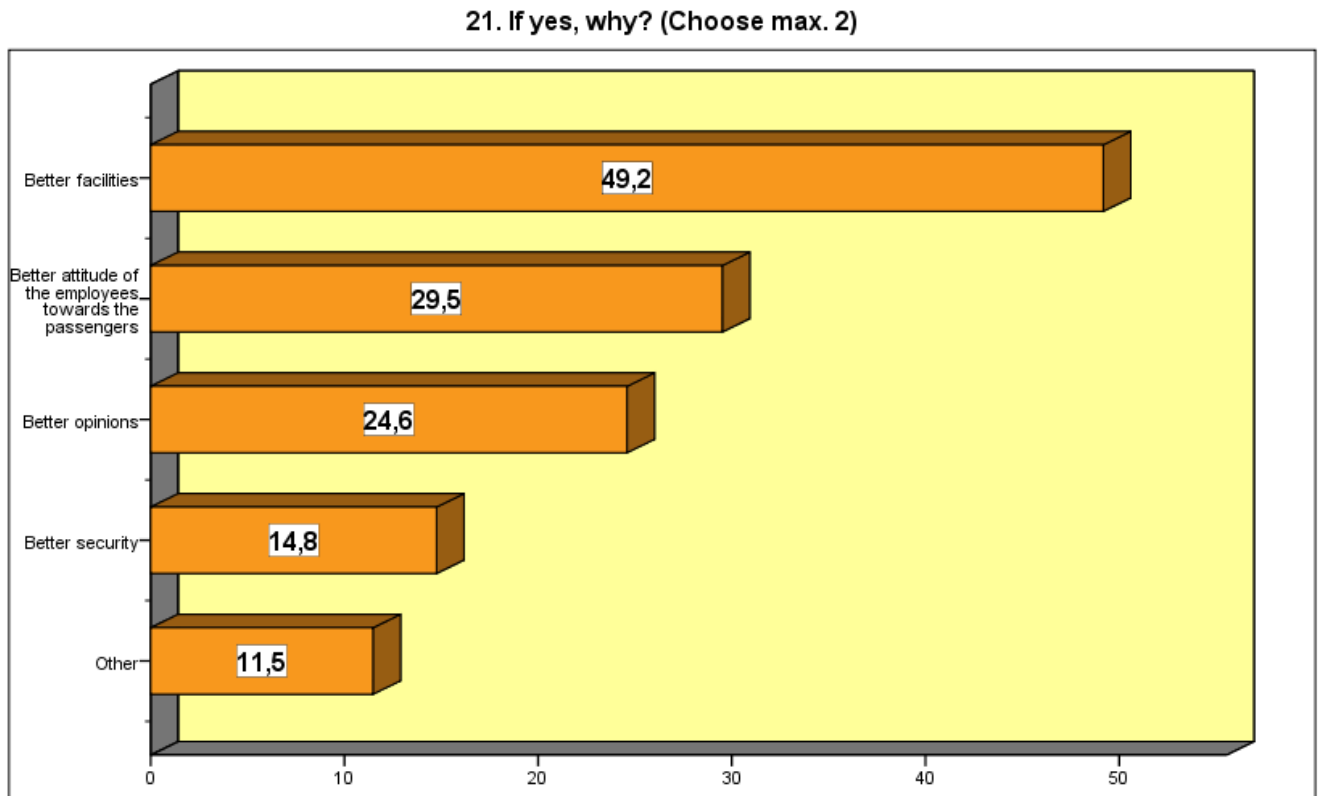
GRAPH 17. Reasons why other airports are better.

There can be many reasons why passengers consider other airports to be better. Some of them were listed in next question, however a few of them gave their own suggestions. Almost half of the respondents indicated better facilities as the main factor. However, in 2013 the new terminal was open and the new ATC tower will soon start working as well (Gazeta 2013). Thus, many of the respondents could not have the possibility to use these new facilities. Second popular answer was 'better attitude of staff towards passengers' with 29,5% which confirms conclusions from this chapter. Almost every fourth respondent voted for better opinions and nearly 15% chose better security. Among suggestions of survey participants, there are: more destinations available, better transportation at the airport, more toilets and more comfortable seats.

TABLE 9. Feelings accompanying passengers going through security control.

I have to do what they say or I will not fly.	happiness	stress	routine	anxiety
unpleasant moment	embarrassing	quickly, politely, gently	certainty, hurry, pressure	doubt, confusion, humiliation,
indifference	Feel like potential criminal, suspect	standard procedures	I would rather not take off my shoes.	everything is fine
lack of respect to my belongings in the hand luggage	rude service, I am treated like a criminal	no emotions	I feel safe	feeling secure, happiness

In the next question, respondents were asked to write down a few words about what they feel during security control in Poznań-Ławica Airport. Examples are presented in Table 9. Most of the answers are associated negatively like being treated without respect, stress, feeling like a criminal. A bit less but still noticeable were neutral

24. Security procedures at the airport bring positive experience.
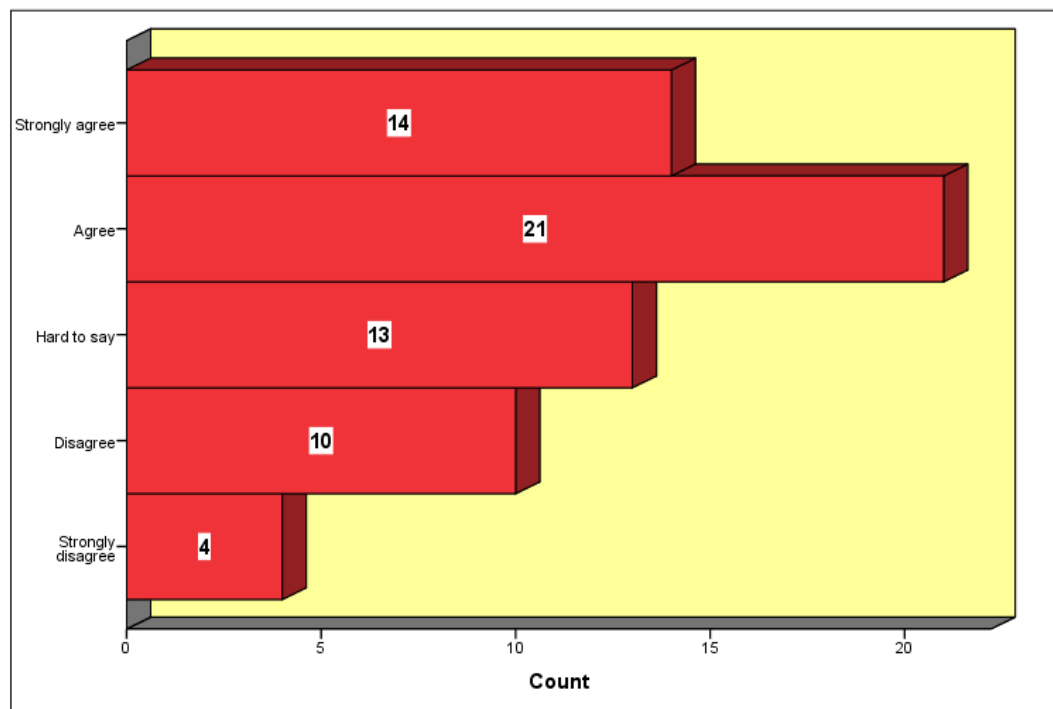
GRAPH 18. Security procedures at the airport as a positive experience.

opinions like being fine, no emotions or routine. In some cases, respondents indicated feeling safe, happy or that they were treated gently.

In order to measure that in another scale, the next question was a statement to which questionnaire participants were asked to respond whether they agree or not (Graph 18.). More than a half (35 out of 62) stated that they agree or strongly agree. For 13 of them it was hard to say, 10 respondents disagreed and 4 strongly disagreed.

In comparison to the previous question, the image turns out to be slightly different. When asked about their feelings while going through the security control, most of them were negative. When asked about an overall feeling about security procedures, more than a half agreed that it is a positive experience. The difference occurs when passengers have to face security guards and show what items they possess at the moment; it makes them feel like suspects. When they look from another point of view, realizing that all of these procedures are for their own good and comfort of safe journey, they tend to agree that it is rather positive.

Another proof that respondents are saying in accordance the same thing about safety in the airport is Graph 18. Vast majority of them answered that Poznań-Ławica Airport is a safe place, 90% of them strongly agree and agree (the same result of 28 answers each). For five respondents it was hard to say and only one disagreed with the statement.

27. Means used in passengers control are too intrusive and might be humbling for some people.
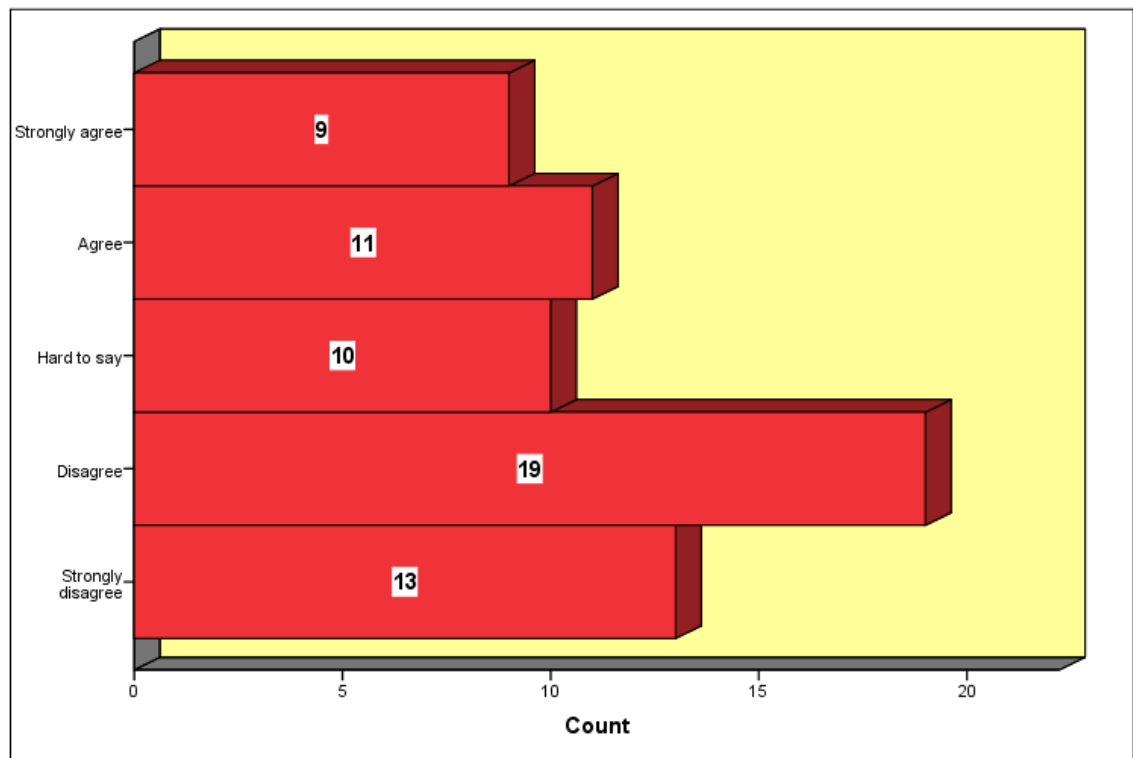
GRAPH 19. Inappropriateness of methods used at passengers' control.

Results obtained from question no. 27 only reflect that result (Graph 19.). Respondents were asked to answer whether they agree with the statement that the means used at the security control are too intrusive so that it might be humbling for some passengers. In the previous graph the majority stated that it brings positive experience and as a result, almost 52% disagree with the statement in this question. Ten surveyed could not decide and 20 of them agreed. Stories quoted in this chapter prove that such situations happen, hence in every question about airport employees, the opinions are always divided as the majority does not experience wrong treatment.

23. Poznań-Ławica Airport is a safe place.
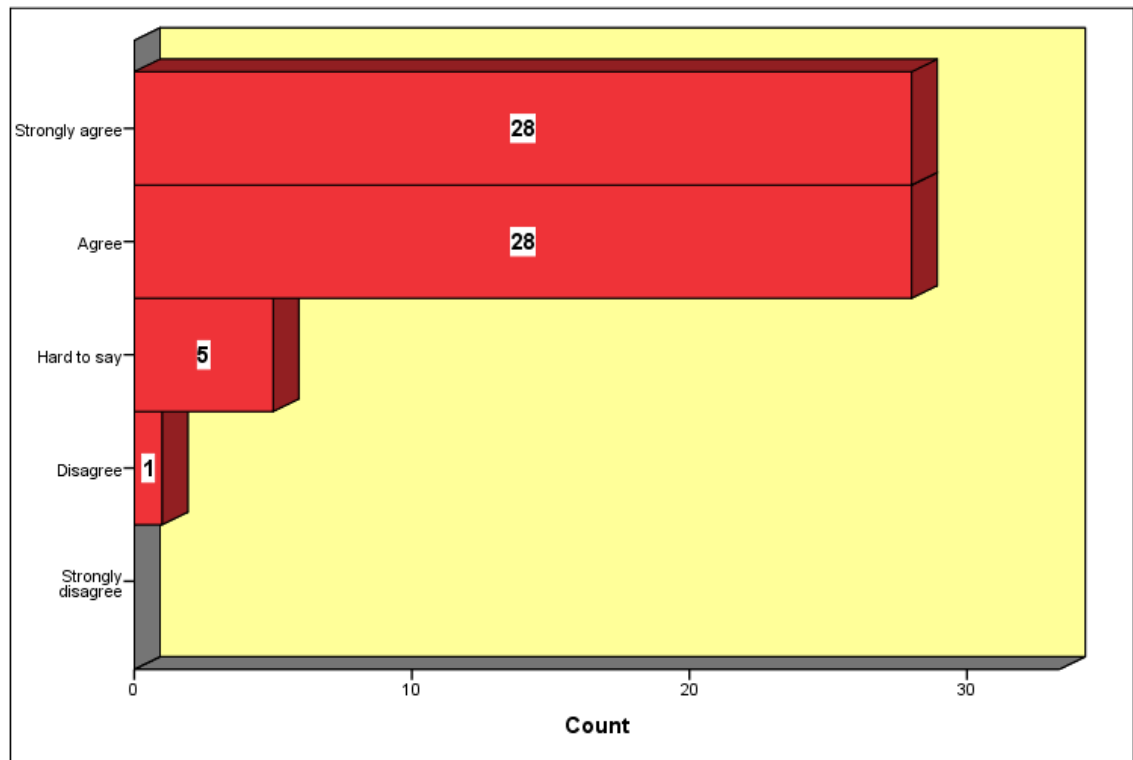
GRAPH 20. Poznań-Ławica Airport is a safe place.

Another question checking passengers' opinion about staff at the airport was if they trust their competencies in case of an emergency (Graph 21.). 12 of the respondents (over 19%) strongly agreed. Most popular answer was 'agree' with almost 34% (21 answers). For 17 respondents it was difficult to decide. 9 of them disagreed and only 3 strongly disagreed. Such number of those who could not decide probably results from lack of such experience. If they have had witnessed an emergency situation or a practical training, it would be easier to assess. Still, over 53% trust them and believe that airport employees are prepared for an emergency.

25. I trust the airport staff competencies and safety measures taken in case of emergency.
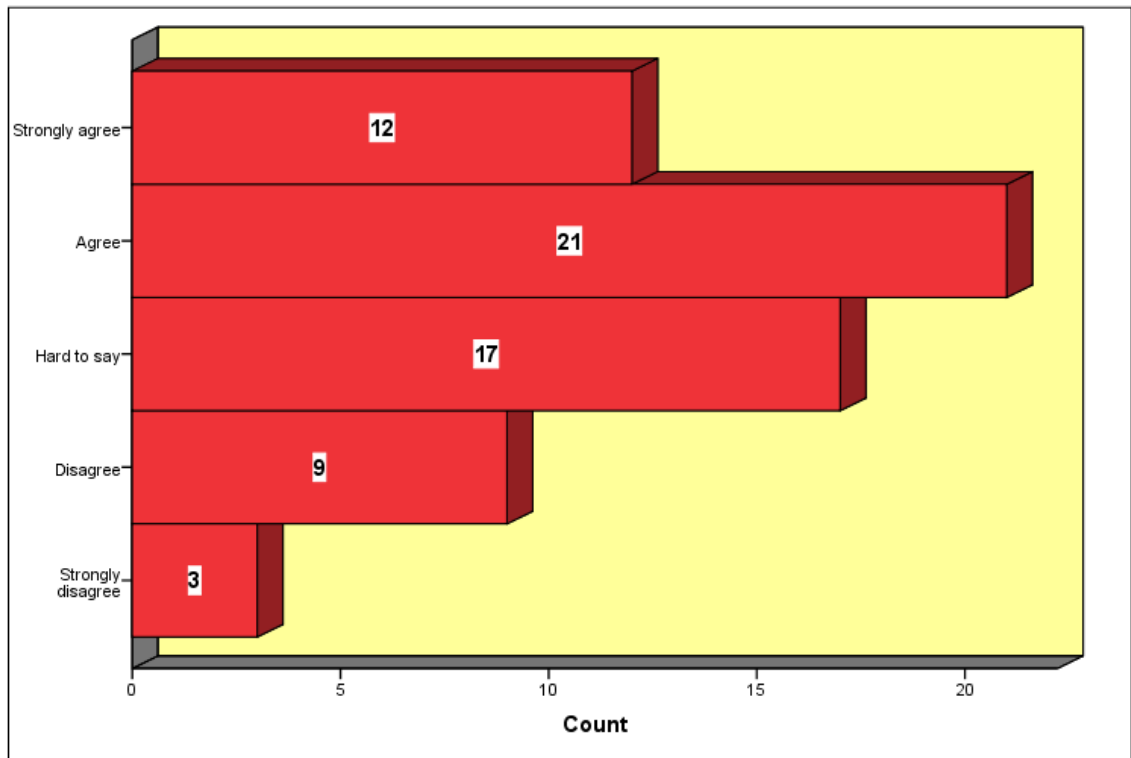
GRAPH 21. Trust towards staff's competencies in case of emergancy.

The second last question was an overall assessment of the airport in terms of safety and security. The scale was from one to ten and respondents were free to motivate their answers if they wanted. Rate 7 was the dominant with 19 answers. Six and eight were also popular with 13 and 15 answers accordingly. Only the highest note has not been chosen. An average note was 6,45.

30. How would you assess Poznań-Ławica airport regarding its safety level in 1-10 scale?
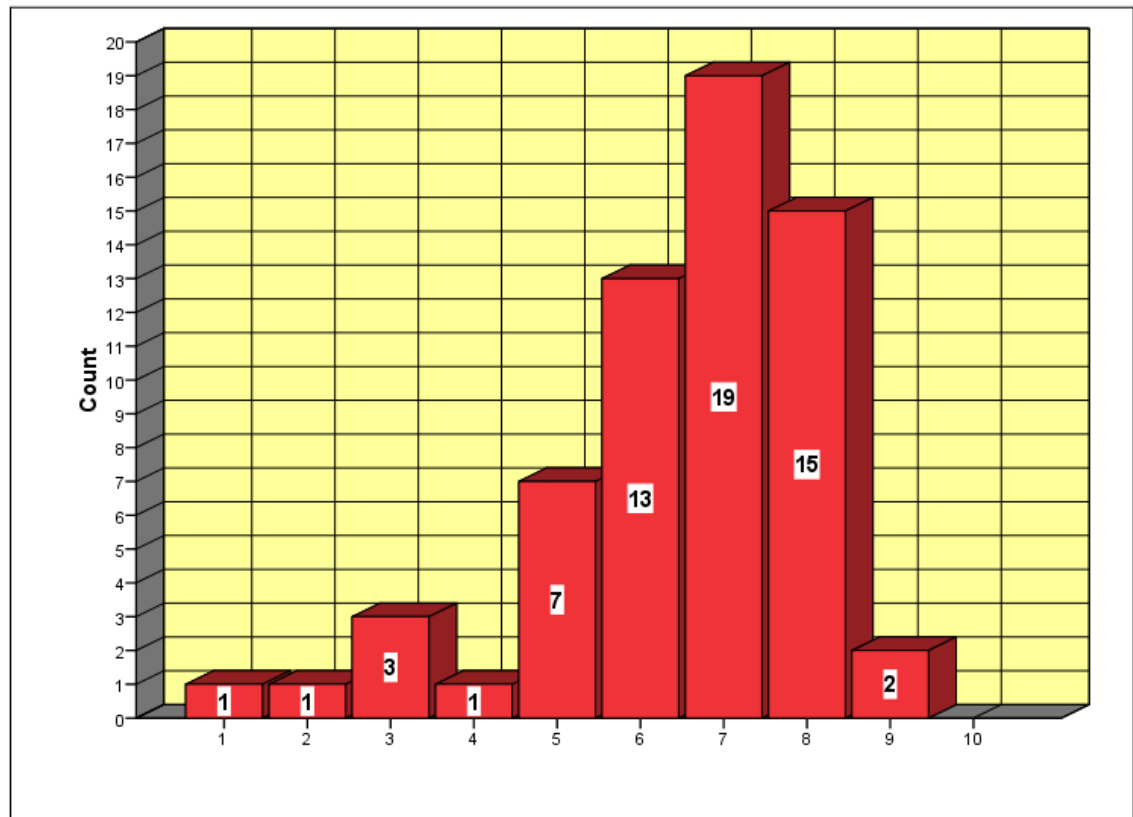
GRAPH 32. Respondents' rate on the airport regarding its safety level.

Among the comments from respondents some opinions could be found. Some examples are quoted below.

> *"In March this year I flew from Ławica to Milan through Munich, operated by Lufthansa. I did not have any checked baggage. I had checked in online and I had my tickets printed. No one checked my ID/passport even once. My ticket was checked during security control, before boarding I had to scan the barcode on my ticket to proceed. It could be possible for anyone to enter the plane if the person had a ticket, not necessarily me. Such situation has not happened for the first time, I use that connection regularly."*

"Embarrassing in comparison with other airports expansion for EU money. Small amount of destinations, there is only a good location."

"Airport as such is good, it is the management that is unable to attract new airlines."

"Lack of space. Misconceived expansion has not helped much. Some of the border guards and airport security service should be sent to a savoir-vivre course."

The last question measured how many of the surveyed would recommend using the airport in Poznań (Table 10.). Vast majority, over 90% (corresponding to 56 respondents) would do it. Only 6 persons would not do it (9,68%).

TABLE 10. Respondents willing to recommend using the service of Poznań-Ławica Airport.

		Frequency	Percent
Valid	Yes	56	90,32
	No	6	9,68
	Total	62	100,0

In this question respondents were also allowed to motivate their answers and many of them did it. Among these opinions, the most frequent ones were positive and negative opinions. Despite poor connections, many respondents would recommend it. Most of them noticed that this is the only airport in this area and it is not profitable to travel few hundred kilometers just to get the lower fare. Some paid attention to fact, that the smaller size of the facilities mean calmer journey, less stress and rush as it is in big airports. According to many respondents, the location of the airport is crucial when it comes to its recommendation and that was the most frequent justification of respondents' opinions.

8 CONCLUSIONS

The report shows some of the crucial factors in civil aviation safety. There are many more issues that influence the sector and provide the safe service for the passengers. This report presents only some of them, focusing on current issues that are faced by the authorities, organizations, airlines and the airport managers.

Humans are still guilty for a majority of the accidents that have happened in the air transportation industry. The technology development allowed transporting people and goods safely around the world in a short period of time with gradually decreasing fares, thus democratizing availability to this mode of transport. All actions undertaken by the organizations associated with air transportation aim to eliminate as many threats as possible.

The responsibility of working in this sector is huge and the consequences of potential inattention or a mistake can result not only in incidents or accidents, but also can allow terrorists to succeed in their plans. As the consequence there might be much economic loss, decrease in demand and many other macroeconomic effects that affect more sectors than just the aviation industry.

The aftermath of all of the tragic events, both intentional and unintentional, have had a great influence on the future of air transportation safety. The examples given in the report showed the changes that took place as a consequence of air crash or act of terrorism. It is impossible to eliminate all the factors that cause dangerous situations, but it can only be believed that the trend showed in GRAPH 1. will continue and that air transportation will be even safer in the future than it is today.

Some of the ways of providing that are described in the report. There are many challenges to make an airport a safe place: to have the instruments to let the aircraft land and takeoff without problems, an ATC to avoid chaos on the apron or the baggage systems so that the highest possible percentage of passengers will get their luggage at the destination.

To sum up the survey, majority of the participants were satisfied with the service of Poznań-Ławica Airport. The main problem which they point out is the staff, often not fully professional, making travelers feel unpleasant, which was seeable in many questions. Still, negative memories are remembered longer and employees are expected to perform their duties on a decent level. Those situations are just a small part of all served passengers, however, it can also create a negative image. In terms of safety, most of the respondents have nothing against the airport policies and they feel secure. Even though some rules seem too strict for them, it is believed that it helps in preventing potential dangerous situations.

In terms of an overall attitude towards flying, surveyors believe that flying is the safest mode of transportation and even though many of them are afraid of an air crash, they still tend to choose this way of travelling. Every person has some way of reducing their stress caused by fear of flying: sleeping, distracting themselves with electronic devices, taking sedatives or drinking alcohol. Even if they could feel safer while flying, it would not affect the number of their journeys.

Even supposing that the respondents were led by a kind of a local patriotism when asked about an overall assessment of the place, the list of improvements to be made according to them is long. Facing reality of losing the fight for the passengers has forced changes so that the management has reduced fares for the operators at Ławica (Głos Wielkopolski 2014.). That is the first step for improving poor connection network which was one of the main disappointments over Poznań-

Ławica Airport according to the respondents. That is a signal for more changes which could possibly change the image that the airport already has.

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Poznań-Ławica Airport (POZ) – measuring passengers' safety feeling.

Dear respondent,
Thank you for participating in my survey. The aim of it is to measure the safety feeling of the passengers using the Poznań-Ławica Airport. The whole information given here is anonymous and will be used only for the purpose of my final thesis ('Please fasten your seatbelt – Increasing civil aviation safety.') which is to be published in theseus.fi by the winter 2015.

Information about the respondent

1. **Age:**

    ○ *Under 18*   ○ *18-24*   ○ *25-34*   ○ *35-44*

    ○ *45-54*   ○ *55-64*   ○ *65+*

2. **Gender:**

    ○ *Male*

    ○ *Female*

3. **Usual purpose of the travel:**

    ○ *Leisure*

    ○ *Work*

    ○ *Studying*

    ○ *Other*

4. **Frequency of using Poznań-Ławica Airport (per year):**

    ○ *less or equal to 1*

    ○ *2-4*

    ○ *5-10*

    ○ *>10*

5. **What type of services do you use mostly?**

    ○ *Regular airlines*

    ○ *Low-cost carriers*

    ○ *Charters*

Safety feelings

6. Are you afraid of flying?

     ◯ *Yes*

     ◯ *No*

     If your answer was no, skip to question number 9.

7. What makes you afraid of flying? Multiple choice, maximum 2.

☐ *Possible terrorism act*

☐ *Phobia (claustrophobia, acrophobia, agoraphobia)*

☐ *Fear of the air crash*

☐ *Fear of the turbulences and bad weather*

☐ *Lack of control over the aircraft*

☐ *Lack of knowledge of flight procedures*

☐ *Being dependent on the competence of third parties*

☐ *Other (what?)* *Kliknij tutaj, aby wprowadzić tekst.*

8. Is there any factor that may influence the safety feeling during the flight?

☐ *Alcohol*

☐ *Distraction (eg. wtih onboard entertainment)*

☐ *Sleeping*

☐ *Taking night flights*

☐ *None of the above*

☐ *Other*

Please answer on how much you agree with the following statements by putting the x in the right box. 5 – strongly agree; 4 – agree; 3 – hard to say; 2 – disagree; 1 – strongly disagree

	1	2	3	4	5
9. I believe that the airplane is the safest mode of transport					
10. Greater safety feeling would let me travel more often.					
11. Detailed passengers control can prevent potential dangerous situations.					
12. Rules of items prohibited after security control are too strict.					

Safety at the Poznań-Ławica Airport

13. What could according to you increase the safety of passengers on the ground? Choose max. 2 answers.

☐*More security guards in the airport*

☐*More detailed control system (passengers/luggage)*

☐*Better monitoring system, more recording equipment*

☐*Safety is already provided.*

☐*Other (what?)* Kliknij tutaj, aby wprowadzić tekst.

14. What are the things you are afraid of at the Poznań-Ławica Airport? Choose max. 2 answers.

☐*Pickpockets*

☐*Act of terrorism*

☐*Luggage loose*

☐*Incompetence of airport staff*

☐*I am not afraid of anything*

☐None of the above

☐*Other (what?)* Kliknij tutaj, aby wprowadzić tekst.

15. How would you assess the security measures at the Poznań-Ławica airport?

    ○ *Insufficient*

    ◉ Just right

    ○ Too strict

16. Have your intimate zone been exceeded during the passenger control at least once?

    ○ *Yes*

    ○ *No*

17. Have you ever been an eyewitness of such situation?

    ○ *Yes*

    ○ *No*

    If yes, you are free to describe it.

18. Does using another airport change your safety feelings?

○ *Yes*

○ *No*

19. Do you consider other airports to be better? If yes, which ones and why?

○ *Yes*

○ *No*

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If your answer was no, skip to question number 21.

20. If yes, why? (Choose max. 2)
☐ *Better facilities*
☐ *Better security*
☐ *Better opinions*
☐ *Better attitude of the employees towards the passengers*
☐ Other (what?) Kliknij tutaj, aby wprowadzić tekst.

21. Please write down some words describing your feelings during the screening and security procedures at the Poznań-Ławica Airport.

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Please answer on how much you agree with the following statements by putting the x in the right box.

5 – strongly agree; 4 – agree; 3 – hard to say; 2 – disagree; 1 – strongly disagree

	1	2	3	4	5
22. Poznań-Ławica Airport is a safe place.					
23. Security procedures at the airport bring positive experience.					
24. I trust the airport staff competencies and appropriateness of safety measures taken up in case of emergency.					
25. Airport is well prepared for an emergency situation.					
26. Means used in passengers control are too intrusive and might be humbling for some people.					
27. I would rather choose another airport for lower fares and worse reputation					
28. New Air Traffic Control Tower will increase the safety.					

29. How would you assess Poznań-Ławica airport regarding its safety level in 1-10 scale?
Wybierz element.

30. Would you recommend the Poznań-Ławica airport to your friend and why?

○ Yes

○ No

Thank you for your participation!