

SANJA BAREŠIĆ, B.Sc.
E-mail: sanjabaresic@hotmail.com
Zagreb Airport
Pleso bb, HR-10150 Zagreb, Republic of Croatia
ŽELJKO RADAČIĆ, D.Sc.
RUŽICA ŠKURLA BABIĆ, M.Sc.
E-mail: skurla@fpz.hr
University of Zagreb,
Faculty of Transport and Traffic Sciences
Vukelićeva 4, HR-10000 Zagreb, Republic of Croatia

Taffic Policy
Preliminary Communication
Accepted: Apr. 11, 2006
Approved: May 22, 2007

A COMPARATIVE ANALYSIS OF BAGGAGE IRREGULARITIES AT ZAGREB AIRPORT

ABSTRACT

Global air traffic has been recording a growing passenger number accompanied by the growth of lost and mishandled baggage on final destinations. Airlines are facing cost-rising consequences that lead to additional problems in global IATA trends to simplify the business and cost reduction policy in the Industry. The World Tracer program, developed for mishandled baggage, based on simplicity and optimal costs has done a lot to improve baggage tracing. Supported by SITA and IATA, the program has been created to meet the needs of airlines and ground handling partners. The Program team leaders are working on improving the tracing procedure to catch up with the growing mishandled baggage problem. The paper examines the issues related to lost, delayed or pilfered baggage worldwide and especially at Zagreb Airport. Zagreb Airport is the World Tracer Management subscriber with its Lost and Found office as a Program user. The annual office statistics clearly point to the rise of mishandled and lost baggage, thus being well suited for the global problem of the growth.

KEY WORDS

mishandled baggage, World Tracer Management, claims investigations, baggage reconciliation system, cost reduction

1. INTRODUCTION

The growth in the number of passengers in the global air traffic led to the rising number of misdirected bags. After the September 11, 2001 terrorist attacks, a more complex security procedure has been developed and additionally caused massive delays in departure time. The IATA¹ proposed transfer connection time suffers from increasing delayed capacities on arriving airlines that contribute to left bags at transfer airports. That volume of baggage presents

“missed baggage problems” on passengers’ final destinations.

Transfer baggage problems make the majority out of the total baggage volume of mishandling baggage, SITA² reported for 2005. The new increase in the number of mishandled baggage shows that quick tracking reconciliation is only partly sufficient in solving the problem of loss. Rising costs impact on airlines has brought SITA and IATA to research and adopt new technologies in eliminating the delays caused by the baggage handling system.

Zagreb Airport is globally well suited for the problem, recording a growing number of passengers, followed by a growing volume of delayed baggage. SITA World Tracer report analysis for Airport Zagreb clearly indicate the transfer reasons as the majority of total reasons for mishandled baggage. Airports Frankfurt, Munich, Vienna, Paris-Charles De Gaulle and Milan-Malpensa represent critical points of transfer – delayed baggage, particularly during the summer and vacation seasons.

As a World Tracer Management subscriber, Zagreb Airport has reached the world standard in tracing process, staff educating and baggage reconciliation software system, accepting new technologies, security procedures as well as SITA and IATA recommendations.

2. THE PROBLEM OF DELAYED BAGGAGE

2.1 Causes of delayed baggage

Using World Tracer’s worldwide lost-baggage inventory, SITA has determined the causes of delayed baggage in 2005 (Table 1) [1].

Table 1 – Causes of Delayed Baggage in 2005

Reasons for mishandling baggage	%
1. Transfer baggage mishandling	61%
2. Failure to load at originating airport	15%
3. Ticketing error/passenger bag switch/ /security/other	9%
4. Loading / Offloading error	4%
5. Space-weight restriction	5%
6. Arrival station mishandling	3%
7. Tagging errors	3%

An amount of 61 percent of all baggage delays are caused by transfer baggage mishandling. ATA³ and IATA have established minimum connecting times for each individual airport. The problem of transfer baggage mishandling could be in the term of arriving flight or departing flight delay. Both can be caused by severe weather, air carrier maintenance or crew problems, air traffic control problems, or security delays. Delays reduce the actual time available to make a connection, resulting in delayed baggage.

The second most common cause of baggage delays (15 percent) is the failure to load the bag at the airport of origin. This can occur when a passenger appears too late for check-in procedure, when there is a last-minute gate change or if the barcode on the baggage tag is not read properly when the bag is being sorted or, for any reason, the bag has to be read manually.

“Ticketing error” occurs when the wrong flight number is recorded on the ticket, and consequently on the baggage tag. “Bag switch” occurs when a ticketing

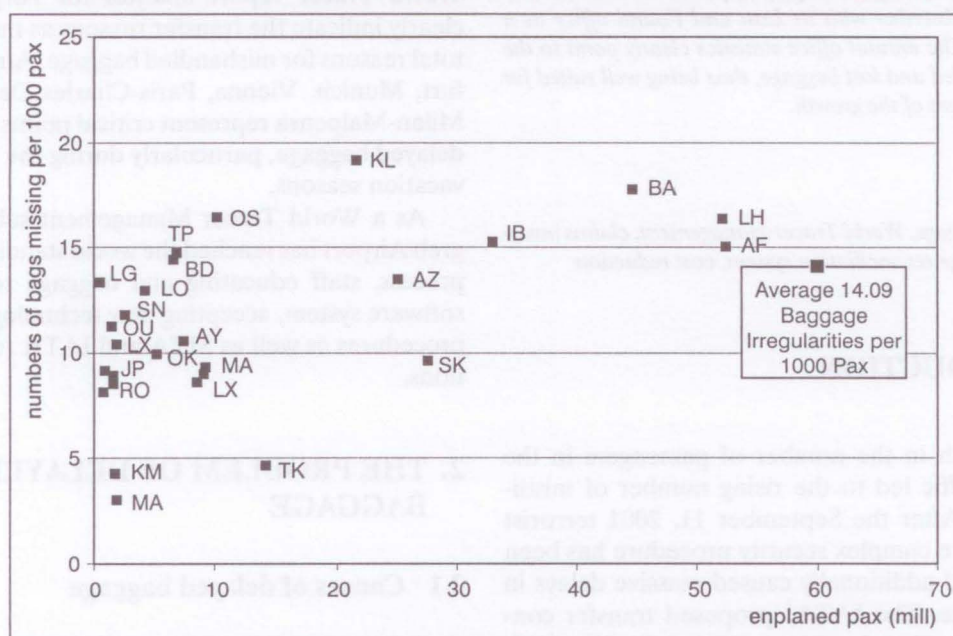
agent places one passenger’s baggage tag on another passenger’s bag.

“Loading” errors include a bag that is loaded on the wrong airplane, or a bag that is loaded in the wrong compartment or wrong container of an airplane, resulting in not being off-loaded correctly at the transfer or final airport. “Offloading” errors include a bag that is not transported to the baggage claim area in a timely manner once it arrives at the destination airport, or a bag that is, by mistake, mixed with connecting bags at its destination airport, or a bag that could be over-loaded at the destination of a wrong airport.

Space-weight restriction delays occur when there is not enough room on-board of a particular aircraft for all the baggage. Arrival station mishandling is similar to “offloading errors,” discussed above, including problems of delivering passenger bags to cargo section instead of bag claiming area, or proper but late delivery of a bag to the claiming area. Tagging errors occur when a tag with a damaged barcode is placed on a bag, or the wrong information is placed on a baggage tag [1].

2.2 Number of delayed baggage per 1,000 passengers

According to AEA⁴ Consumer Report for 2005, baggage irregularities were measured at 14.1 missing bags per 1,000 passengers compared with 13.9 in 2004. AEA notes that on average 85% of the missing bags are traced and delivered to their owners within 48 hours. As illustrated in Figure 1, an analysis of European Carriers shows that the number of irregularities is related to airline size, e. g. the top 4 carriers in Europe rank list with regards to baggage performance [2].



3. WORLD TRACER – GLOBAL BAGGAGE TRACING

3.1 World Tracer profile

World Tracer is a Program that sets the standard for baggage service worldwide. It incorporates IATA and SITA rules and recommendations concerning baggage tracing. The program is helping in the rapid recovery of misrouted passenger baggage, providing the information exchange within an airline or among airlines worldwide, also providing the customization of baggage handling requirements.

The user group of the Program coordinators of airlines and handling agents worldwide meet annually to exchange views, prioritize problems that need to be solved, make improvements of the Program, following new trends in the baggage industry.

3.2 Baggage Tracing

The Tracing bag process provides continuous tracing for up to 100 days. The Program maintains a large seamless worldwide database of on-hand and forwarded baggage information in the form of files, agent-to-agent messages, text-form wide spectra of additional lost-bag information. World Tracer offers various file-masks needed to be filled in by agents. File elements consist of external and internal baggage characteristics for lost, pilfered, damaged or wrongly received bags, i. e. passenger's name, permanent and temporary addresses, colour and type of the bag, flight-route, flight reroute, bag tag number, sort of damage, etc.

The Program also offers additional features like "Contents Assembly Guide", "Country Codes" page, flight-information scheduled data service - aiming to provide the agents with maximally precise and rich information files for quick and high-quality match of "lost" with "found" bag information.

A history of all the transactions for each baggage file is transparent, sharing the data, time, changes in data and the identity of the agent who created the file.

3.3 Baggage Management

Airlines and handling agents are able to create, retrieve and amend all types of baggage records as well as exchange messages with other industry baggage tracing systems in a seamless way. The Program subscribers are also offered to log and search for unchecked properties left on airplanes or at terminal buildings. The Found Property Register retains a log for 30-90 days.

3.4 Comprehensive management and claims investigation

World Tracer Management offers a high quality of claims processing, quality control, system supervision and fraud prevention. The system is rich in reporting capacity, providing 28 different options reports. They can be reported daily, monthly, yearly or focusing on data as the fault-stations, reasons for loss, carriers on which loss-reports were made etc.

Subscriber members are provided with the possibility of monitoring the files, matching them with other files from other member airlines.

3.5 Internet Service

SITA developed an Internet interface to the World Tracer Baggage System. The Internet service use replaces phone calls or personal traveller visits to check the status of their baggage search. Each airline has on its web page a connecting link concerning lost bags problems. The access option to traveller is the mask needed to be filled in with name and file reference number. Once, when a page is accessed, the passenger is given basic information about the bag status and the stage of procedure their baggage has reached, regardless of the airline's host system.

3.6 World Tracer as Partner of the Industry

Developed by SITA and co-sponsored by IATA, the World Tracer represents a well-organized service for mishandled bags in a seamless way. Based on a single shared database the Program is used by over 360 world carriers and ground handling companies in more than 1960 airports worldwide. The system is adapted to use technologies such as the Internet, Short Message Service (SMS), Wireless Application Protocol (WAP), Integrated Voice Recognition (IVR), Kiosks and Common Use Self-Service (CUSS) [3].

4. ZAGREB AIRPORT – GLOBAL PROBLEMS STRIKE LOCALLY

4.1 Growth of arriving passenger number

The Zagreb Airport annual reports show constant growth of arriving passengers and the number of lost baggage claiming reports. The figure is about to reach the best pre-war period of almost 1,900,000 annual passengers. The ZLZ statistics sample (Table 2) shows a rising passenger number for the period 1985-1990, followed by a rough fall during the period of the war. Since 1994, Zagreb Airport has been recording constant rising period of passenger number, with the expectation of 1,800,000 passenger figure for 2006 [4].

Table 2 – Zagreb Airport, total passenger number for period 1985 – 2005

Year	PAX Number	Year	PAX Number
1986	1,618,450	1996	1,008,646
1987	1,866,314	1997	1,080,697
1988	1,831,017	1998	1,106,854
1989	1,536,969	1999	1,080,676
1990	1,629,998	2000	1,149,830
1991	644,487	2001	1,186,471
1992	303,622	2002	1,203,436
1993	665,307	2003	1,314,652
1994	902,698	2004	1,408,206
1995	902,925	2005	1,551,519

Source: Airport Zagreb Statistics Report, Statistics Department

4.2 World Trace analysis of the growth

Zagreb Airport has been the World Tracer Management subscriber since 1996. The airport Lost and Found office is a Program customer as well as a handling agent for domestic and foreign carriers that operate for Zagreb Airport.

The annual Zagreb Airport World Tracer statistics data point to a rise in the number of passengers and lost bag reports, following the global problem of the growth.

According to the total number of arriving passengers and the total number of lost baggage claiming reports irregularities were measured at 12.87 missing bags per 1,000 passengers in 2004 compared with 14.72 missing bags per 1,000 passengers in 2005.

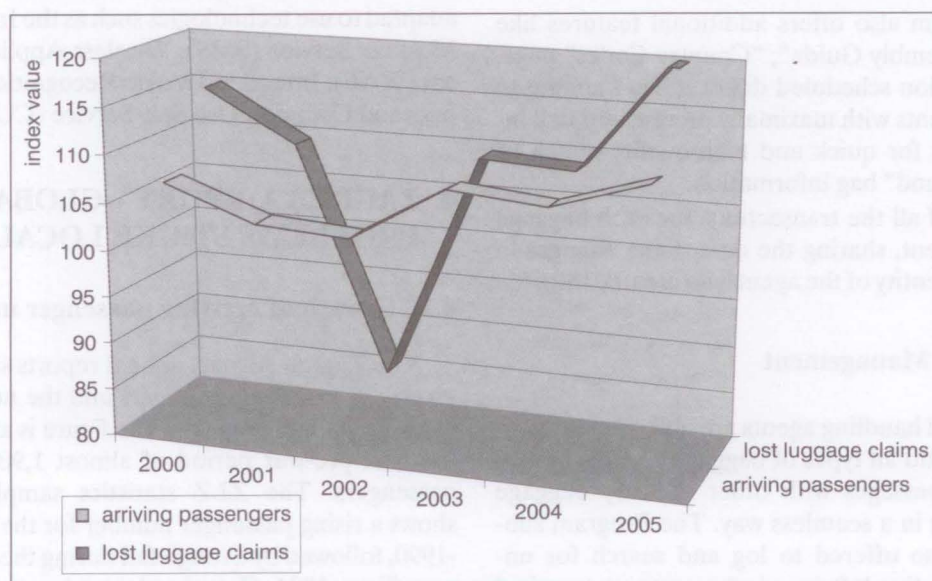
Table 3 – Growth of the arriving passengers and lost baggage claims number, Zagreb Airport, 1999-2005

Year	Arriving Passengers Number	Lost Bags Claiming Reports Number
1999	529,222	8,395
2000	565,843	9,664
2001	584,786	10,586
2002	600,694	8,966
2003	651,223	9,817
2004	700,013	9,903
2005	773,663	12,006

Source: SITA annual statistics for Zagreb Airport, Lost and Found office data, 1999-2005

The correlation index compared the arriving passenger number with the lost baggage claims; 2000–2005 shows almost constant growth for the period (Figure 2). Disproportion in the form of rough fall for 2002 is reflected by two specific cases in 2001:

1. Before collapse in October, 2001, the Swissair carrier had brought the rise of 213.3% in volume of delayed baggage compared to 2000. The crisis in investment losses had directly influenced the baggage carrying service. Crossair – the Swiss operating scheduled service formed after the 2001 bankruptcy, roughly reduced the number of mishandled bags operating for ZLZ in 2002.⁵
2. After the terrorist strike in September, 11, new security procedures set up in the USA caused massive baggage delays in the European central transfer hubs, in the second half of September. That snowballed intensive rise recorded in the volume of delayed baggage at Zagreb Airport, although

**Figure 2 - Correlation index between arriving passengers and lost bag claims, Zagreb Airport, 2000- 2005**

Source: SITA annual statistics for Zagreb Airport, Lost and Found office data, 2000-2005

the arriving passenger number was stagnating (Figure 2).

4.3 Transfer baggage mishandling and weight restriction – local problems

Table 4 – Causes of delayed baggage in 2005, Zagreb Airport

Reasons for Mishandling Baggage	ZLZ Data
1. Transfer Baggage Mishandling	60%
2. Failure To Load At Originating Airport	5%
3. Ticketing Error/ Passeng Bag Switch/ Security/ Other	20%
4. Loading/ Offloading Error	2%
5. Space-Weight Restriction	7%
6. Arrival Station Mishandling	5%
7. Tagging Errors	1%

Source: Zagreb Airport Lost & found office data, 2005

SITA World Tracer reported annual data for Zagreb Airport, 2005, show almost identical percentage compared to global data for transfer baggage mishandling problem (Table 3).

The analysis made on lost bags report, 2005, marks airports Frankfurt, Amsterdam- Schipol, Paris- Charles De Gaule, Munich and Milan- Malpensa as five central hubs from which the majority of delayed bags have transfer delay-code. Security delays added to arriving delays of connecting USA flights means major-

ity of transfer bottlenecks on European transfer hubs listed above.

The second single most common cause of baggage delays (7 percent) is space-weight restriction. Annually operational planned aircraft with not sufficient room on-board for all baggage are the particular problem for airports in Prague, Vienna and Budapest [5].

Hungarian Malev carrier operates from Budapest on route to Zagreb mostly by CRJ 200 or Fokker 70 version with space restriction for boarding passengers' baggage interlined from USA and Canada. With 30 kg per item, every adult passenger may check in up to two pieces of baggage which make incomplete boarding baggage service for the listed aircraft version. The whole families directed to Zagreb mean at least 100 kg of allowed checked-in baggage with strong weight restriction at the transfer point [6].

A similar problem occurs with long-haul routed passengers transferred in Vienna or Prague airports where Croatia Airlines and Czech Airlines operated with ATR42 or 72 versions on route to Zagreb.

4.4 Top carriers regarding passenger number and mishandled bags volume

Regarding all carriers operated for Zagreb Airport, 2005, Croatia Airlines, Lufthansa, Air France, Austrian Airlines and Alitalia, are listed as five top carriers regarding the lost baggage problem. The same five companies rank the top list considering the number of arriving passengers.

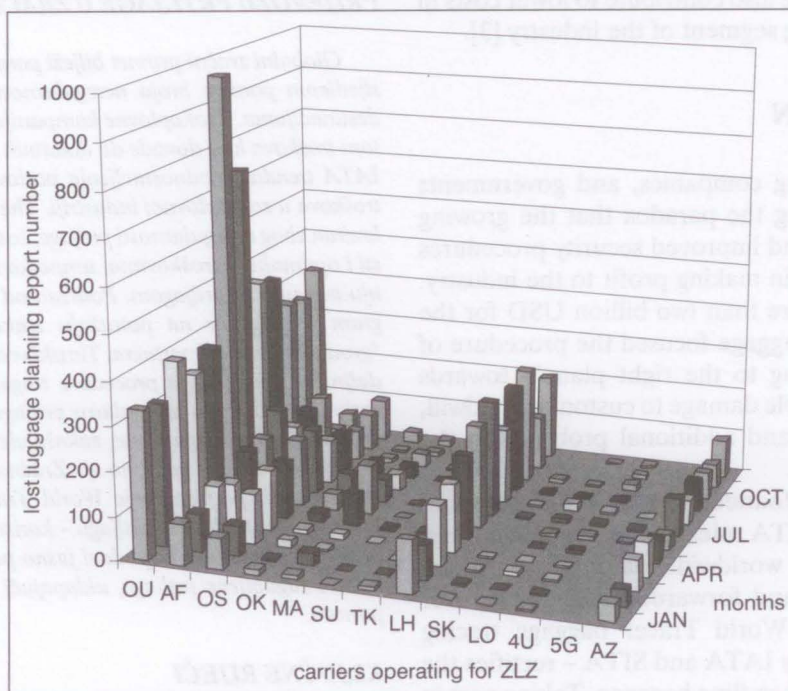


Figure 3 - Number of lost baggage claiming reports by carriers, 2005

Source: SITA annual statistics for Zagreb Airport, Lost and found office data, 2005

The national carrier, Croatia Airlines accounts for 46% out of the total lost baggage capacity, carrying the majority out of total arriving passengers (67.28%). It is followed by Lufthansa with 18.06% out of total lost baggage files, with 9.13% out of the total number of arriving passengers.

Airports Frankfurt, Munich, Vienna, Paris - Charles De Gaulle and Milan - Malpensa, represent the major European transfer hubs with delayed baggage. Although minor number interlined to Zagreb, considering total capacity of noted airports, the global "pressure" has its reflections in the shape of massive delayed baggage directed to Zagreb Airport as the final destination.

5. COST PROBLEMS

SITA estimates that 3 billion bags were checked worldwide in 2005, and approximately one percent (30 million) of those bags were mishandled. Regarding the mark of 1%, the rise is up from 0.7% in 2004. Costs range from USD 25 to 150 per each misdirected bag. The same source reported the amount of USD 2.5 billion that cost world airlines in 2005, compared with USD 1.6 billion in 2004 [7].

World Tracer's benefits in terms of cutting the costs in the industry is in gaining immediate, worldwide access to created files among airlines or handling companies. The system replaces the paperwork by electronic storage for up to three years. Interface with other industry baggage systems and easy passenger approach to the internet service also contribute to lower costs in the baggage handling segment of the industry [3].

6. CONCLUSION

Airports, handling companies, and governments are collectively facing the paradox that the growing passenger number and improved security procedures are barely sufficient in making profit to the industry. Annual losses of more than two billion USD for the global mishandled baggage focused the procedure of "getting the right bag to the right plane"- towards eliminating remarkable damage to customer goodwill, potential lost sales, and additional problems in the cost reduction policy.

Since 1995, when founded, the World Tracer module, incorporating IATA rules and recommendations, has maintained the worldwide database of found, missing, unclaimed and forwarded baggage in over 145 countries. The World Tracer baggage tracing module, supported by IATA and SITA - rectifies the consequences of mishandling baggage. Taking part in the industry, the World Tracer authorities are involved in the global problem of rising passenger num-

ber and delayed baggage. Working on improvements in the field of matching left bags with the airport of owner-made report for loss, presenting high quality real time information between airlines, airports and handling agents, with easy access to the internet passenger service, the World Trace system contributes to the global industry trend of simplifying the business and reducing costs.

The annual statistics reports for Zagreb Airport show a constant growth of the passenger number, aiming to achieve the best pre-war passenger volume period. The increase in the number of lost baggage is partly caused by the growth in passengers directed to Zagreb, as the final destination. The majority of the local baggage irregularities problem is caused by global irregularities trends. SITA-reported Zagreb Airport data are highly comparable to global data, particularly in the matter of the transfer baggage irregularities issue.

SANJA BAREŠIĆ, dipl. ing.

E-mail: sanjabaresic@hotmail.com

Zračna luka Zagreb

Pleso bb, 10150 Zagreb, Republika Hrvatska

Dr. sc. **ŽELJKO RADAČIĆ**

Mr. sc. **RUŽICA ŠKURLA BABIĆ**

E-mail: skurla@fpz.hr

Sveučilište u Zagrebu, Fakultet prometnih znanosti

Vukelićeva 4, 10000 Zagreb, Republika Hrvatska

SAŽETAK

KOMPARATIVNA ANALIZA NEREDOVITOSTI U PRIJEVOZU PRTLJAGE U ZRAČNOJ LUCI ZAGREB

Globalni zračni promet bilježi porast broja putnika sa posljedicom porasta broja neregularnosti prtljage na krajnjim destinacijama. Zrakoplovne kompanije suočavaju se sa porastom troškova koji dovode do dodatnih problema u globalnom IATA trendu pojednostavljenja poslovanja i politike rezanja troškova u zrakoplovnoj industriji. The World Tracer-program kreiran zbog neregularnosti prtljage, zasnovan na jednostavnosti i optimalnim troškovima, umnogome je pridonio poboljšanju traganja za prtljagom. Podržan od SITA-e i IATA-e, program je odgovor na potražnju zrakoplovnih kompanija i "ground handling" partnera. Timski voditelji programa rade na daljnjem poboljšanju procedure traganja, kako bi doskočili rastućem problemu neregularne prtljage. U članku su istraženi problemi u svezi izgubljene, zakašnjele ili otuđene prtljage na globalnoj razini te posebno za Zračnu luku Zagreb. Zračna luka Zagreb potpisnica je World Tracer Menadžmenta, sa Službom za izgubljenu prtljagu - korisnikom programa. Službeni godišnji statistički podaci jasno pokazuju porast neregularne i zagubljene prtljage, uklapajući se u globalni problem porasta.

KLJUČNE RIJEČI

neregularna prtljaga, World Tracer upravljanje, procedura traganja, sustav usklađivanja prtljage, rezanje troškova

REFERENCES

1. IATA-International Air Transport Association-a trade association representing and serving the airline industry world-wide.
2. SITA ("Société Internationale de Télécommunications Aéronautiques") - the world's leading service provider of IT business solutions and communications services to the air transport industry.
3. ATA - The Air Transport Association of America is the premier trade organization of the principal US airlines. ATA members transport more than 90 percent of all US airline passenger and cargo traffic.
4. AEA - The Association of European Airlines - a non-profit-making association, acting on behalf of all its members, actively engages with the institutions of the European Union, as well as all the relevant European and international organizations in the aviation value chain.
5. SITA reported 715 claiming reports for lost bags made on Swissair in 2000, 1525 claiming reports in 2001, and 302 reports for lost bags in 2002.

LITERATURE

- [1] *Hearing on Mishandled Baggage: Problems and Solutions*,
<http://www.house.gov/transportation/aviation/05-03-06/05-03-06memo.html>, (20.05.2006)
- [2] *AEA Annual Consumer Report 2005*,
<http://www.aea.be>, (22.5.2006)
- [3] *World Tracer profile*,
<http://www.worldtracer.aero/aboutWT.html>, (22.11.2005.)
- [4] *Zagreb Airport Analyses*, Statistics Department, Archive
- [5] *SITA annual statistics for Zagreb Airport*, Lost and found office, Archive
- [6] *Malev Customer Service Manual*, 2006, Malev representative office, Zagreb Airport
- [7] *Mishandled baggage costing \$2.5 billion as air travel passenger numbers soar to two billion says SITA*,
http://www.sita.aero/News_Centre/Press_releases/Press_releases_2006, (22.04.2006.)