



SAFE TRANSPORT OF DANGEROUS GOODS BY AIR IN THE LEGAL ASPECT

dr Malgorzata LASOTA
Akademia Sztuki Wojennej

Abstract

Safe transport of dangerous goods by air is extremely important. In the event of accident, human life can be seriously endangered. In order to avoid accidents, there are legal principles which must be adopted. There are international and national principles, which are described in the article. Implementation and obeying of law guarantees the highest level of safety while dangerous goods are transported by aircraft.

Key words: dangerous goods, transport by air, safety, legal documents, law

Introduction

More than half of the cargo carried by all means of transport in the world is dangerous cargo, including: explosive, corrosive, flammable, toxic, radioactive or miscellaneous¹. These dangerous goods are essential for a great variety of global medical, industrial, commercial and research requirements and processes. Because of the advantages of air transport, e.g. time saving, a great amount of this dangerous cargo is carried by aircraft.

Dangerous goods are all the articles and substances which are capable of posing a risk to human beings, to their health, safety, property or the environment and are shown in the list of dangerous goods in the Technical Instructions and in Dangerous Goods Regulations. Dangerous goods can be carried safely by air transport providing certain principles are adopted. These principles are, among other things, provisions of law. Only application of law by all States and operators guarantees safety while dangerous goods are transported by air.

Aviation law connected to air transport of dangerous goods:

1. Annex 18 to the Convention on International Civil Aviation — The Safe Transport of Dangerous Goods by Air, Fourth Edition, July 2011;

¹ www.icao.int/safety, 6.10.2016.

2. Technical Instructions for the Safe Transport of Dangerous Goods by Air, 2015 – 2016 Edition, Doc 9284, International Civil Aviation Organisation;

3. Dangerous Goods Regulations International Air Transport Association, Effective 1 January 2016 – 31 December 2016, Produced in consultation with ICAO, Fifty seventh Edition;

4. Council Regulation (EEC) No 3922/91 of 16 December 1991 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation; this Regulation has been adopted in Poland since 14 October 2014 for local flights;

5. Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council; this Regulation has been adopted in Poland since 29 October 2014 for other flights;

6. Polish Aviation Law of 3 July 2002;

7. Regulation of the Transport Minister of 13 July 2012 on the specific conditions of international flights with dangerous goods.

Annex 18 to the Convention on International Civil Aviation —The Safe Transport of Dangerous Goods by Air, Fourth Edition, July 2011

The International Civil Aviation Organisation recognises the validity of this kind of cargo and has taken actions to ensure that such cargo can be carried safely. This has been done by adopting Annex 18, together with the associated document Technical Instructions for the Safe Transport of Dangerous Goods by Air; however, the most important document in international aviation law is the Convention on International Civil Aviation Document 7300, also known as the Chicago Convention, which was signed on 7 December 1944 in Chicago.

Safe transport of dangerous goods by airplane only guarantees the application of law provided in the three mentioned documents.

The ICAO requirements for dangerous goods have largely been developed by a panel of experts which was established in 1976. This panel has continued to meet and recommend the necessary revisions to the Technical Instructions. The ICAO accepted and passed the first edition of Annex 18 on 26 June 1981 and this regulation was enacted on 1 January 1983 and used by the States one year later: 1 January 1984. The second edition of Annex 18 was launched in 1989 and the third in 2001. Currently, the fourth edition is mandatory².

² Annex 18 to the Convention on International Civil Aviation —The Safe Transport of Dangerous Goods by Air, Fourth Edition, July 2011.

The Regulations of Annex 18 is kept aligned with the recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods and with the regulations of the International Atomic Energy Agency. The use of these common bases by all forms of transport allows cargo to be transferred safely between air, sea, rail and road modes and there is no need for classification, identification, packing, marking, labelling or documentation to be repeated.

Annex 18 has been edited in six languages: English, Arabic, Chinese, French, Russian and Spanish. Each Contracting State has the responsibility to select one of those languages for the purpose of national implementation and for other effects provided for in the Convention. The Contracted State can use the texts directly or translate into its own national language.

Annex 18 consists of a foreword and thirteen chapters.

There is historical background in the foreword and the relationship with the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284)³.

Moreover, the attention of Contracting States is drawn to the obligation imposed by Article 38 of the Chicago Convention, by which Contracting States are required to inform the ICAO of any differences between their national regulations and practices and the International Standards contained in Annex 18. According to Article 38 of the Convention on International Civil Aviation, which is titled *Departures from Standards and Procedures*, Contracting States are obliged to notify the ICAO about differences between its own practice and that established by international standard⁴.

Chapter 1, titled *Definitions* contains definitions which unify all used terms. This is extremely important, because only by using consistent terminology can high safety level be reached.

Chapter 2: *Applicability* states that the standards and recommended practices of the Annex shall be applicable to all international operations of civil aircrafts. This means Annex 18 is not applicable to army or police aircraft.

In cases of extreme urgency or when other forms of transport are inappropriate or when full compliance with the prescribed requirements is contrary to the public interest, the State may grant an exemption from the provisions of the Technical Instructions, provided that an overall level of safety in transport is the same or higher than that defined in the Technical Instructions. There is a recommendation in the chapter that the States should take the necessary measures to achieve compliance with the Annex and the Technical Instructions for domestic civil aircraft operations.

Furthermore, the Contracting States are obliged to establish an appropriate authority to be responsible for ensuring compliance with this Annex.

³ Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284), ICAO, Fourth Edition, 2011.

⁴ Convention on International Civil Aviation Organization signed 7 December 1944, ICAO(Doc. 7300).

Chapter 3 titled: *Classification* contains information about classification of articles and substances which shall be in accordance with the provisions of the Technical Instructions.

There is also the notification that the detailed definitions of the classes of dangerous goods are contained in the Technical Instructions. These classes identify the potential risks associated with the transport of dangerous goods by air and are those recommended by the United Nations Committee of Experts on the Transport of Dangerous Goods.

Limitation on the transport of dangerous goods by air is described in Chapter 4. The limitation is concerned with dangerous goods that are identified in the Technical Instructions as being forbidden for transport in normal circumstances and with infected live animals. Moreover, articles and substances that are identified by name or description in the Technical Instructions as being forbidden for transport by air under any circumstances must not be carried on any aircraft.

Chapter 5 is connected to packing of dangerous goods. The chapter contains short information about containers which have to be good quality, and constructed and closed to avoid leakage. Changes in temperature, humidity, pressure or vibration are normal transport conditions and containers must be strong enough to withstand such conditions.

Packaging has to be suitable for the contents. This means containers in contact with dangerous goods shall be resistant to any chemical or other action of such goods.

Inner packaging is vital as well. It must be packed and secured in a way which prevents breakage or leakage. It has to be easy to control movement within the outer packaging during normal conditions of air transport. If absorbent materials are used, they must not react dangerously with the contents of the packaging.

Chapter 6 is concerned with labelling and marking. It is emphasised that each package of dangerous goods must be labelled with appropriate and labels specifically described in the Technical Instructions. Each package of dangerous goods must be marked with the proper shipping name of its contents and, when assigned, the UN or ID number. English should be used for the markings related to dangerous goods.

Chapter 7 is titled *Shipper's responsibilities*. Before a person offers any package or overpack of dangerous goods for transport by air, this person shall ensure that the dangerous goods are not forbidden for transport by air and are properly classified, packed, marked, labelled and accompanied by a properly executed dangerous goods transport document. The document must be completed, provided to the operator and signed by the person who offers dangerous goods for transport by air. The document must contain all information required by the Technical Instructions.

Operator's responsibilities are involved in Chapter 8. Firstly, an operator must not accept dangerous goods for transport by airplane if there are no completed transport documents (except in a case when such document is not required). Each item of dangerous goods, such as a package, overpack or freight container, must be inspected. An operator has to use an acceptance checklist as an aid for compliance with the provisions. Another operator's responsibility is inspection of containers and

packages containing radioactive materials for evidence of leakage or damage. In the event of damage or leakage, the materials must be unloaded or not loaded on board.

If any package of dangerous goods loaded on an aircraft appears to be damaged or leaking, the operator's responsibility is to remove such package from the aircraft, or arrange for its removal by an appropriate authority or organisation. An operator must be sure that no other package has been contaminated.

Another interesting piece of information is that dangerous goods are not allowed to be carried in an aircraft cabin occupied by passengers or on the flight deck of an aircraft, except in circumstances permitted by the provisions of the Technical Instructions. If there is hazardous contamination on an aircraft due to leakage or damage of dangerous goods, the goods should be removed from the aircraft straightaway and without delay.

Separation and segregation of dangerous goods are important safety procedures. Packaging containing dangerous goods which might react dangerously with others shall not be stowed on an aircraft next to each other or in a position that would allow interaction between them in the event of leakage. Packages of radioactive materials must be carried on an aircraft so that they are separated from people, live animals and undeveloped film, in accordance with the provisions in the Technical Instructions. All cargo containing dangerous goods must be placed in such a way that any movement in flight which would change the orientation of the packages is prevented.

Packages of dangerous goods with the "Cargo aircraft only" label must be loaded in accordance with the provisions in the Technical Instructions. This means they are forbidden in passenger aircrafts.

Chapter 9 *Provision of information* is devoted to procedures which should be carried out while dangerous goods are transported by air. First of all, the operator of an aircraft in which dangerous goods are to be loaded must provide the pilot-in-command with written information about the dangerous goods on board and the exact place where they are as early as possible before departure of the aircraft.

Secondly, passengers have to be warned about the types of dangerous goods which are forbidden from being transported on an aircraft.

Furthermore, all people involved in the transport of dangerous goods by air must be provided with instructions as to what kind of action they should take in the event of emergency situations arising involving dangerous goods. In the event of an emergency, the pilot-in-command, as soon as the situation permits, has to inform appropriate air traffic controllers.

In the event of an aircraft accident, a serious incident or an incident with dangerous goods involved, the operator of the aircraft must inform emergency services without delay as to what kind of dangerous goods there are on board.

Chapter 10 is titled: *Establishment of training programmes* and states that dangerous goods training programmes should be established and updated.

Chapter 11 *Compliance* refers to the necessity of establishment of inspection and enforcement procedures in order to achieve compliance with dangerous goods regulations. The chapter emphasises that each Contracting State has not only to

establish the procedures, but also cooperate with other States concerning violations of dangerous goods regulations.

Chapter 12 *Dangerous goods accident and incident reporting* is connected to each Contracting State's duty to establish procedures for investigating accidents and incidents which occur in its territory with the transport of dangerous goods.

Chapter 13 *Dangerous goods security provisions* pays attention to security measures which have to be established by each Contracting State. Their establishment is vital in order to minimise theft or misuse of dangerous goods by terrorists and criminals. Such action can endanger people, property and the environment.

Technical Instructions for the Safe Transport of Dangerous Goods by Air

The Technical Instructions for the Safe Transport of Dangerous Goods by Air⁵ are comprehensive rules which must be used in international transport of dangerous goods. The Instructions emphasise basic law connected to dangerous goods transport by air contained in Annex 18. The rules are extensive and they are obligatory in air transport. Recommended procedures for the transport of all types of dangerous goods are developed by the United Nations Subcommittee of Experts on the Transport of Dangerous Goods (SCoETDG) and in the field of radioactive materials by the International Atomic Energy Agency.

The Instructions are usually updated every two years. Currently, Edition 2015–2016 is effective. Every edition is effective as long as the next is edited.

The Technical Instructions are divided into eight parts which contain chapters.

Part 1 *General* prescribes broad requirements applicable to the international transport of dangerous goods by air. There are six chapters in this part and they contain information such as: limitations to the quantity of dangerous goods transport by air, training requirements and dangerous goods security. Safe handling of dangerous goods firstly identifies a limited list of unsafe substances to carry in any circumstances and then shows how other potentially dangerous articles or substances can be transported safely.

Safe transport of dangerous goods by air is greatly dependent on the appreciation of all people concerned with the risks involved and on understanding of the regulations. Initial and recurrent training programmes have to be established and maintained by operators, ground handling agencies, freight forwarders, shippers of dangerous goods and agencies engaged in the security screening of passengers and their luggage or cargo.

Part two *Classification* contains classification of dangerous goods, their definitions, classes and divisions.

⁵ Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284), ICAO, Fourth Edition, 2011.

Class 1 includes all kinds of explosives, such as: sporting ammunition, cartridges, cords, fireworks, signal flares and explosives forbidden in air transport.

Class 2 comprises gases: compressed or liquefied, which may also be toxic or flammable. Examples are: gas cartridges, cylinders of oxygen and refrigerated liquid nitrogen or helium.

Class 3 substances are flammable liquids including gasoline, heating oil, lacquers, paint thinners, etc.

Class 4 covers flammable solids, spontaneously combustible materials and materials which, when in contact with water, release flammable gases (examples are some powdered metals, cellulose type film and charcoal).

Class 5 covers oxidizing material, including bromates, chlorates or nitrates; this class also covers organic peroxides which are both oxygen carriers and very combustible.

Class 6 comprises poisonous or toxic substances, such as pesticides, mercury compounds, etc., and infectious substances which must sometimes be shipped for diagnostic or preventative purposes.

Class 7 covers radioactive materials are mainly radioactive isotopes needed for medical or research purposes but are sometimes contained in manufactured articles such as heart pacemakers or smoke detectors.

Class 8 covers corrosive substances which can be dangerous to human tissue or hazardous to the structure of an aircraft, for example: caustic soda, battery fluid, paint remover.

Class 9 is a miscellaneous category for other materials, potentially hazardous in air transport: magnetized materials which could affect the aircraft's navigational systems, genetically modified micro-organisms (GMMOs), genetically modified organisms (GMOs).

Part 3 *Dangerous goods identification* contains a list of dangerous goods and specific information needed in order to transport them by aircraft, such as: proper shipping name or description, class or division, quantity in passenger and cargo aircraft possible to transport, and type of hazard label which must be attached. Dangerous goods are assigned to UN numbers or ID numbers which can be found in the list.

Part 4 *Packing* sets out packing instructions for all classes of dangerous goods and specifically for some articles and substances. General packing requirements for classes: 3, 4, 5, 6, 8 and 9 are divided into three packing groups: packing group I for substances presenting high danger, packing group II for substances presenting medium danger, and group III for substances presenting a low level of danger.

Part 5 *Shipper's responsibilities* describes particular duties of the shipper. The shipper is responsible for all aspects of the packing, labelling, marking etc. of dangerous goods in compliance with the Technical Instructions. While preparing each package of dangerous goods, the shipper's responsibilities are: to check if the type of packaging is appropriate, restrict the overall quantity per package to the limits specified in the list of dangerous goods, and fill in documents using the proper shipping name.

The requirements found in Part 6 *Packaging* specifications and performance tests are connected to the specifications, tests, marking rules for packaging and the test for Limited Quantity Packaging.

Part 7 *Operator's responsibilities* details actions of operators with regard to the acceptance, handling and loading of dangerous goods. The operator's acceptance personnel must be trained in an adequate way in order to detect dangerous goods present in general cargo. The operator's staff must always work using an acceptance checklist to be sure nothing is omitted.

Part 8 describes requirements concerning crews and passengers connected to transport of dangerous goods by air.

The Technical Instructions contain an extensive description of procedures and rules concerning all aspects of transport of dangerous goods by air. The principles used in the Instructions are intended to provide such level of safety that dangerous goods can be carried safely without placing an aircraft or all people on board at risk, providing all the requirements are fulfilled. They try to ensure that if a possible incident occurs, it cannot lead to an accident.

Dangerous Goods Regulations Manual – IATA

IATA – the International Air Transport Association edits Dangerous Goods Regulations⁶ every year and they are effective for only one year from 1 January to 31 December. At the beginning of each year, the IATA Regulations Manual is edited.

There are nine chapters:

1. Applicability
2. Limitations
3. Classification
4. Identification
5. Packing
6. Packaging specifications and performance tests
7. Marking and labelling
8. Documentation
9. Handling
10. Radioactive material

Generally, the ICAO Annex 18 together with the Technical Instructions for the Safe Transport of Dangerous Goods by Air are applicable for the Member States of ICAO. There are differences between the ICAO and the IATA Regulations which come from operational considerations. Some regulations may be different but the safety level must be the same or higher than in the ICAO.

⁶ Dangerous Goods Regulations, 57th Edition, 2016.

The European Union's regulations

Transport of dangerous goods by air in European Union law is covered by two regulations:

1. Council Regulation (EEC) No 3922/91 of 16 December 1991 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation; this Regulation has been adopted in Poland since 14 October 2014 for local flights;

2. Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council; the Regulation has been adopted in Poland since 29 October 2014 for other flights.

The first Regulation constitutes that a high general level of safety in civil aviation in Europe should be maintained and current technical requirements and administrative procedures in the Member States should be raised to the highest standard. Safety is a key factor in Community air transport⁷.

The second Regulation contains requirements referred to transport of dangerous goods by air in Appendix IV, PART CAT, SUBPART A, General CAT. GEN. MPA 200 Transport of Dangerous Goods⁸. The Regulation constitutes that transport of dangerous goods has to be applicable to the ICAO Annex 18 and the Technical Instructions (ICAO Doc. 9284-AN/905). According to the Regulation, dangerous goods may be transported by operators approved in Appendix V (PART SPA) Subpart G, unless:

- the regulations are not applicable to the Technical Instructions according to Part 1, or
- dangerous goods are carried by crew members or passengers or they are placed in their checked luggage according to Part 8, the Technical Instructions.

Furthermore, an operator is responsible for instituting procedures to avoid carrying unreported dangerous goods to an aircraft.

Next, the operator's responsibility is to deliver information to its own personnel to enable all persons to perform their duties in an appropriate way.

The Regulation also emphasises that an operator is responsible for reporting incidents and accidents with dangerous goods.

⁷ Council Regulation (EEC) No 3922/91 of 16 December 1991 on the harmonization of technical requirements and administrative procedures in the field of civil aviation

⁸ Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council

The Act of 3rd July 2002 – Aviation Law

Principles regulating aviation law in Poland are contained in the Act of 3rd July 2002 – Aviation Law⁹. There are two articles connected to transport of dangerous goods.

Article 153a states that in the case of international flights of civil aircraft with dangerous goods which are forbidden or conditionally allowed for transport on board, the Polish Civil Aviation Authorities can issue permission for such flight.

According to article 66, in the event of flights of civil aircraft with dangerous goods which are forbidden or conditionally allowed for transport on board and carried dangerous goods are for military purposes and the aircraft takes off from a military airport and lands on a military airport, then the Minister of National Defence gives permission.

Regulation of the Minister of Transport of 13 July 2012 on the specific conditions of international flights with dangerous goods.

The Regulation defines the conditions which must be fulfilled for international flights with dangerous goods on board of civil aircraft. Article 3 states that norms, standards and recommended practices have to be applicable with the Chicago Convention signed on 7th December 1944, Annex 18 and the Technical Instructions.

In accordance with the Regulation¹⁰, Polish Civil Aviation Authorities may approve of international flights with dangerous goods (in case it regards that permission).

Conclusions

The main international document containing requirements and regulations on transport of dangerous goods is the Convention on International Civil Aviation signed in Chicago on 7th December 1944. The detailed requirements are prescribed in the Technical Instructions which are an enhancement to Annex 18 ICAO and strengthen its regulations.

The IATA Dangerous Goods Regulations are applicable to all airlines which are Members of the Organisation and all shippers and agents that offer consignments of dangerous goods to these airlines.

⁹ The Act of 3rd July 2002 Aviation Law

¹⁰ Regulation of the Minister of Transport of 13 July 2012 on the specific conditions of international flights with dangerous goods.

Transport of dangerous goods in Poland is defined in two documents: the Act – Aviation Law and the Regulation of the Minister of Transport. The documents sent to international regulators: the ICAO and IATA.

There is a project of the act – Transport of dangerous goods by air¹¹, but so far it has not been implemented. An appropriate level of safety may give only coherent legal principles, so it is important to implement national law connected to transport of dangerous goods.

Bibliography

Legal documents

Convention on International Civil Aviation Organization signed 7 December 1944, ICAO (Doc. 7300).

Annex 18 to the Convention on International Civil Aviation – The Safe Transport of Dangerous Goods by Air, Fourth Edition, July 2011.

Technical Instructions for the Safe Transport of Dangerous Goods by Air, 2015 – 2016 Edition, Doc 9284, International Civil Aviation Organisation.

Dangerous Goods Regulations International Air Transport Association, Effective 1 January 2016 – 31 December 2016, Fifty seventh Edition.

Council Regulation (EEC) No 3922/91 of 16 December 1991 on the harmonization of technical requirements and administrative procedures in the field of civil aviation.

Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.

The Act of 3 July 2002 Aviation Law.

Regulation of the Transport Minister of 13 July 2012 on the specific conditions of international flights with dangerous goods.

The Internet

legislacja.rcl.gov.pl.

icao.int/safety.

¹¹ legislacja.rcl.gov.pl, 13 October 2016.