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V.N. Pershakov, Cand. Sci.(Eng.)
S.S. Vinograd
D.V. Skalova
E.Y. Grebenyuk
A.S. Fesh

THE ANALYSIS OF RESEARCH OF PROJECTING, BUILDING AND OPERATION OF CARGO TERMINALS OF THE CIS AIRPORTS

NAU Institute of Ecology and Design, e-mail: pershakov1@vambler.ru

Summing up and analysis of research of projecting, building and operation of cargo complexes of CIS airports are made based on the normative documents, typical projects and existing cargo complexes.

Introduction

The structure of economic ties inside the state and with others has changed due to the independent status of Ukraine.

By the decision of 19.03.97 №224 the Cabinet of Ministers of Ukraine obliged the ministries and departments to bring all norms and rules according to the requirements of norms and rules of standards of European Union(EU), as well as recommendations of ICAO (International Organization of Civil Aviation).

Nowadays the essence of cargo transportations has changed. Cargo transportation is the kind of service that can be provided by an airport; an airline which has cargo terminals at its disposal, another juridical person(private, mixed, joint stock enterprise).

Every year the amount of cargo transportation increases and this is beneficial for both home and foreign airlines.

Cargo transportation is a perspective kind of air carriage; it can raise real currency profit, which will contribute to the economy of Ukraine growth.

By the estimation of experts the amount of cargo transportation by air transport on the world market will increase approximately by 6,6%, and passenger carriage by 5,1%, that will lead to doubling of cargo airplanes quantity, and then it will be necessary to increase the quantity of cargo terminals (tab. 1).

Table 1

Annual increase of cargo air transportation in Ukraine until 2010, that are forecast, tkm, mln

Cargo	Low	Middle	High
Freight	6,0	6,9	9,0
Mail	3,4	4,0	4,5
Total	5,9	6,8	8,9

Research analysis

Generalization and analysis of normative documents of projecting cargo terminals were carried out of the CIS airport complexes.

The design and research inststute “Aeroproject” worked out norms of technological projecting of airport cargo complexes (VNTP 5-80/MCA) [1], VNTP 5-85/MCA [2] and textbook of development of these norms development (untill VNTP 5-85/MCA) [3].

The textbook of projecting of airport cargo complexes [3] was worked out for the development of norms [2], was intended for projecting cargo terminals of the former USSR and includes auxiliry materials, methods of calculation of main indicators, tables, and graphical data.

The norms [1] are worked out many years ago for conditions of the former USSR and do not meet modern international requirements and market economy of Ukraine cargo transportation on commertcial basis.

The norms do not meet modern requirements of cargo terminals projecting of Ukrainian airports because of the absence of positions of volume planning and constructive decisions, about automatization of loading-unloading works in cargo terminals, and absence of the positions about sanitary, epidemiologic, radiation control of cargo, about customs control of cargo etc.

Now new demands of dividing Ukrainian territory into temperature zones are worked out, which envisage compulsory co-ordination of norms and rules with requirements, normatives and positions of EU, ICAO.

Analysis of the norms [2] shows:

– existing norms [2] for projecting cargo airport complexes were worked out many years ago for the conditions of the former USSR and do not correspond to modern international requirements;

– norms were worked out for requirements of the former Union, because they naturally do not reflect the changed status of independent Ukraine and the character of market economy;

– the normes do not include the changing character of cargo transportation (its excess of international and interstate over domestics transportations;

– the norms pay little attention to hiding dangerous radioactive wastes;
– there is no section on volume-planning and construction decisions;– In norms elaboration it is necessary to pay attention to automatization of warehouses;
– it is also necessary to harmonize all positions of norms with international requirements and positions of ICAO and EU;
– it is necessary to include a new division of the territory of Ukraine into temperature-climate zones;
– in the norms are absent technological schemes on cargo flows, locaton of equipment of mechanization.
A lot of positions in the book [3] are old and do not include the changing of the structure of cultural connections inside the state and between the states.
That is why is changed the character of cargo transpormation, geographical transportations.
In the book [3] does not include such parts as constructive decissions, engineering equipment, automatization of loaded-unloaded works, hiddence of radioactive and dangerous cargo (that is very actual nowadays) the quantity of the staff,absence of positions about radiational, sanitary controls.
The book [3] does not correspond to the demands of market economy of Ukraine in the part of commercial transportations of cargo, standards of EU and ICAO.
Also it has the analysis of:
– methods of the complex valuation of projective decisions of stored cargo of airports;
– snip 2.11.01-85* Sore buildings;
– recommendations of projecting of stores of material-technical supplying of civil aviation;
– book of projecting the airports CA (in the development VNTP 1-85 MCA);
– programme of preparing of the staff for transformation of dangerous cargo (ICAO). Staff which provides to service passangers;
– programme of preparing the staff for transportation of dangerous cargo.Book 6.Loads;
– international standards and recommendedl practice.Safety transportation of dangerous cargo by air craft addition 18 to convention about international civil aviation;
– norms of technological projection of stores of supplyings and complectation (VNTP 01-86);
– specialized cars of earth service for transportation of cargo;
– recommendations of projection of cargo mechanization comlexes of a high capacity.
Based on the analysis of mentioned norms, textbooks, methods,recommendations for projecting of cargo complexes of airports it can be pointed out that:
– all analized normative documents for projecting of cargo complexes of airports are worked out many years ago and some positions are old;
– the norms do not meet the requirements of market economy of Ukraine-cargo terminals on commercial basement:
– № 506-151.87 (arch. A-354) “Cargo warehouse capacity 600 t (300 t/h) for airports CA”;
– № 506-170.12.89 (arch. A-1372) “Cargo warehouse capacity 300 t (150 t/h) for airports CA”;
– № 506-170.12.89 (arch. A-1372) “Cargo warehouse capacity 200 t (70 t/h) for airports CA”;
– № 506-170.12.89 (arch .A-1372) “Cargo warehouse capacity 100 t (30 t/h) for airports CA”.
The projects worked out in 1987-89 in correspondence with the existing at that time normative documents. Constructive solution of buildings, stores of carcase type were made using mixed concrete constructions. The form of buildings in the plan is a T-form.
Analysis of technological and capacity planning decisions of building cargo complexes of airports allows to point out their rationality. For using principal schemes in the practice of projecting Ukrainian airports it is necessary to allocate premises for control and storage of customs cargo, to increase room for valuable and very valuable cargo,to increase room for security. It is necessary to foresee premises for radiation and biological control of special cargo state.
The projects do not foresee big volume of mixed transportations (passenger cargo) of tourist-commercial type, position about automatization of loaded-unloaded works, positions about sanitary, radiational control of cargo, which are transported, positions about international and interstate transportation, position about security of environment, connections with demands, norms and positions of EU, ICAO.
The norms do not correspond to annual aconomics of Ukraine-cargo transportation on commercial basis.
It is necessary to include the main technological flows into:
– airplane–warehouse–city;
– city–warehouse–airplane;
– airplane №1–warehouse–airplane №2 (transportation between countries).
The character and essence of cargo transportation in the next period have changed:
– increase of volume of international cargo;
– appearance of international transportations and cargo terminal is used, as transit;
– appearance of necessity to set up so-called offshore zones.

Generalization and analysis of research of buildings and operation of cargo as the complexes were also made.
airport Alma-Ata in 1988 was one of the first to use automatization system of control. The basic functions of a cargo complex are:
– registration of cargo of a warehouse of departure and warehouse of arival;
– preparation of mail cargo shipment for flight, operative correction of combination;
– formation and keeping of archive data and giving out archive documents;
– analysis of fullfilling of plans and taking steps to increase commercial loading of airplanes.
To maintain auto system of cargo transportation control of local computation network.
At present the main functions in many airports are carried out manuely, information is provided through radio- and voice connection.
The main building of cargo terminal of international airport Borispol was built in 1988 with mixed metal constructions (tab. 2).
The technological zone of store is devided into two zones:
– a zone of high shelf keeping of small cargo, worked in auto regimes;
– a zone of shelf keeping of big cargo service by electroloaders.
Storehause realizes turnover according to schemes:
– city(from clients) – store–apron (on board airplane) – 46% of general cargohouse;
– apron-storehouse–city – 31%;
– apron-store–apron(transit) – 25% .
Disadvantage is, that cargo terminal is located in security zone of an airport.
It is very difficult to service clients. The new cargo terminal does not use fully hight volume of the building.
The airport Borispol has cargo transportation dominating passenger airplanes, cargo is not packed, noncontainerised.
The buildings and installations of the cargo complex of international airport Kyiv (Zhulyani) over the past years have been rented by JSC "Air Kyiv Cargo" which works on the market of airtransportation and transport-operation services.
The freight complex of the airport includes the main building (tab. 2). Loading-unloading yard is not includes to the apron and located at the distance of 0,7 km from the airplane parking place.
Conteiner method of transportation of cargo is not used.Information about cargo is kept in the PC memory.
The state company Dniproavia uses airport Dnipropetrovsk and carries out international and domestic passenger and cargo air transportations. Cargo storehouse is located within the store passenger loading complex of airport (tab. 2).
A modern cargo terminal is the store with infrastructure and complex of services.
By the way, the store-house terminal should have store-house-observation zone, on which is widespread in Russia.
Store-house inspector always is located in the store. By the way in the office located representative of Market Industrial Unit, fitocontrol, participants of which can be only at store-house-observing. For easier through out store-house for own clients, it can be calculated not only keeping but also widespread of circle of service users.
Analysis of operation of loading terminals points out the necessity of big onefloor store areas of 10,15,25 thousand square meters with high level of mechanization and automatization at middle hight of store 4,3 – 4,6 m.
Store areas in the middle are used:
– height from 4,5–5,5 up to 70%;
– height 5,6 –6 m near 60%;
– bigger height – up to 40%.
The reasons of making equipment of little stores (in the middle 700 square meters) and absence of necessary equipment.
In industrially developed countries they build onefloor automated storehouses.
In Japan there are near 2000, in USA and Germany– more than 1500.
Optimal height depends on given conditions.
In UK – 15 m, USA, Germany, Sweden-from 9 to 20 m and more, in Japan and Swiserland – up to 30 m, and also multi-storey ones.
The modern methods of automatization let us more effective operation of store areas which are 18 m heigh, 60–150 m long. Stores have to be transportable.
Inspection of warehouses terminals carried out in airports Boryspil, Kyiv and Dnepropetrovsk shows that more effective development and works of terminal is in airport Boryspil that is the biggest international airport of Ukraine.
In addition, these complexes have their general problems:
– automatization of cargo terminal;
– the organization of customs and other services and respective constructions for them;
– reconstruction and repairing of old buildings and installations;
– it is necessary to take into account requirements of international organizations on transportations;
– ecological requirements;
– to take into account changes of technical streams of cargo;
– simplification of works with clients.

Table 2

Characteristics of loading complexes of Ukrainian airports

Airport	International airport Boryspil	International airport Kyiv (Zhulyany)	International airport Dnipropetrovsk
Airline	15 world aviacompanies	PJSC "Air Kyiv Cargo"	"Dnipravia"
Aviatransportations (loadings)	International. Between countries. Inner	International. Betwen countries. Inner	International. Inner
Loading complex. Main buildings and loading installations	Full firms of plant model "Limex" with metal constructions. Store 72x60 m, zones of store keeping of loads. Columns, beams, trusses with metal. Grid of columns 6x12 m. Store height 11,86 m. Carcase scheme	Stores №1,2-815 m^2. Passing room 75 m^2. Administrative 80 m^2. Store-house-lisensed store №12-208 m^2. Izotop store-300 m^2. Dispatcher unit building	In contents of passenger-loading complex of airport. Administrative building. Dispatcher unit. 5 sections of stores 750 m^2 . Shelf-store-box 360 m^2
Loading yard	Places of airplane's parkings. Roof 12x60 m. Parking	Located on 0,7 km from MC airplanes	Near place of airplane parking with incoming gates
Aircraft, which do air transportations	All types of airplanes	Ан-26, Ан-32, Ан-74, Ан-12, Ан-22, Ан-124,Іл-76	Як-40, Ан-12, Ан-24
Security	Regime-security zone of airport	Department of inner bussines of airport. Security signalization	Allday security
Fire prevention	Automated, necessarily	Fireprovention signalization	All stores have fire prevention system
Overloading	–	Year–6000 t Per day–30 t	1500 t/month
Regime of work	Allday	Allday	2workday/day All 4 workdays
Quantity of staff	160 men	60 men	4men/workday
Technical processes	Automatizated store cranes. Electroloaders. Loading board cars	Disiel autoloading. Loading car ЗИЛ-110	3 auto АПК-12 (on the base of plant GAZ). 1 auto АЛ-3А (on the base of plant ZIL) 2 loading type Balkan
Equipment	Complective, underloading platforms. Conveyer. Store table. Transport – keeping. IBM PC	Underfloors. Transporting loads. IBM PC. Passing room connection. Introscop	Complective tables. Electrotelfer. Passing room connection with dispatcher unit a/p

Conclusion

On the basis of carrying out generalization and analysis of the designing experience and exploitation of cargo complexes of airports in CIS according to normative documents, to typical projects, to working cargo complexes we can make the following conclusions and propositions.

1. Existing norms, the textbook of methodics of cargo terminals projects of the CIS airports do not correspond to international standard requirements of the European Union, recommendations of ICAO, market economy of Ukraine.

2. In total cargo transportation there are 20%–of internal transportations, 80%–of international transportations.

There appeared new services on the territory of cargo terminal: frontier, custom, migration, radiation, sanitary supervision, etc.

3. In typical projects it is necessary to locate the place for control and maintaining customs cargo, to increase areas for places with valuable cargo, places for radioactive and place for radio and bio controls of special cargo conditions.

It doesn't consider the volume of intersection transportations (load-passengers).

4. The lacks of cargo transportations of Ukrainian airports are:

− cargo terminals that are in mode-security zone of airport which make difficulty in passengers services;
– the areas doesn't completely used;
– packing and container doesn't executed;
– there is no necessary mechanized equipment;
− organization of custom and other services;
− reconstruction and repairing of old buildings and constructions.

There are have to be developed new norms for cargo terminals designing according to mentioned about conclusions and proposition.

Literature

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В.М. Першаков, С.С. Виноград, Д.В. Скалова, О.Ю. Гребенюк, А.С. Феш
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