Рис. 3 График изменения усредненных плановых координат в течении суток

Восход солнца начинается в 5:30, а закат в 19:50 по местному времени. Согласно рисункам 2-3 делаем вывод, что температура влияет на положение базовой станции путем деформационных расширений конструкций, на которых установлена базовая станция. Солнце всходит на востоке, нагревает сначала одну сторону GNSS станции, при этом идет интенсивное нагревание воздуха, стоит отметить, что в 11 часов повышение температуры воздуха замедляется, он уже почти достиг своего максимума. На рисунке 3 линии перемещения пересекаются примерно во время прохождения солнцем зенита. С 11 до 19 часов температура воздуха отклоняется в малых пределах (около 4 градусов), что выражается в плавно изменяющемся графике. С 19 по 23 часа происходит интенсивное остывание GNSS станции. С 23 по 7 часов на GNSS станцию почти не влияет солнце. Можно отметить, что при интенсивном изменении температуры, изменение положения GNSS станции, так же больше, чем при малом изменении температуры.

В заключении, можно сказать, что тепловое расширение материалов GNSS антенны, ее крепления, поверхности грунта, здания (если станция расположена на нем) оказывает влияние на точность ее позиционирования. Полученные погрешности не окажут существенного влияния на проведения геодезических изыскательных работ, но при проведении геомониторинга земной поверхности, или использовании этих данных в научных целях, данные погрешности лучше устранить, введя систему поправок в полученные результаты и жестко закрепив антенну с помощью материалов, которые менее подвержены тепловому расширению.

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Pentiukova E.O.

Activities of airports as part of transport system of the country

*Far Eastern State Transport University
(Russia, Khabarovsk)*

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Аннотация

Данная статья посвящена вопросам решения задач аэропортов-хабов. Проведен анализ причины проблем, возникающих в деятельности хабов, а также государственных программ, направленных на развитие отрасли.

Ключевые слова: транспортная система, пассажирооборот, аэропортовая деятельность, хаб, транспортный комплекс.

Abstract

This article is devoted to the issues of solving the hub-airport problems. The causes of problems arising in the activities of hubs, as well as government programs aimed at the development of the industry are analyzed.

Key words: transportation system, passenger traffic, airport activity, hub, transportation industry.

Relevance. The development of Russian transportation system is the key issue of its functioning and development in the current context. Nowadays, air transportation is one of the most globalized segments of the transportation system, as it is able to quickly serve the needs of world trade, handle international transit cargoes from flight to flight, efficiently serve passenger traffic, etc. The article [1] indicates that Russian transportation system includes all contemporary types of transport – railway transport, automobile transport, sea transport, river transport, air transport and pipeline. The share of air transport in the total volume of passenger traffic is 0.5%, and in the carriage of goods even less - 0.02%, while in the passenger traffic the “weight” of air transport is significant - 42.8%. Air transport is a dynamically developing form of passenger transport [1]. Therefore, airports with high-quality service are the key to the development of country and the subject of competition. Due to the fact that the Russian Federation is making significant efforts to diversify the economy, including the development of the transit opportunities of the airspace of the Russian Federation.

Main part. Orientation to the development of the transit opportunities of the airspace of Russia is due to the fact that nowadays the main air cargo traffic flows between North America, Europe, and the Asia-Pacific region (from 80 to 90% of the world air cargo market). Whereas, Russian airspace is often the most optimal [2]. When using the hub model in the Russian Federation, revenues from transfer freight will rise, and an increase in traffic will be an incentive for the development of both the cargo terminal and the airports themselves.

As indicated in [3], airport networks operate on the basis of airports. In addition, the author defines an airport as a complex of buildings that is intended for receiving, sending, basing aircraft and servicing air transport, having an aerodrome for this purpose, an air terminal (there are often several air terminals at major airports), one or several cargo terminals and other ground facilities. and the necessary equipment. "

In the coming years, the airport network of Russia will face major changes. According to the plans of the Ministry of Transport of the Russian Federation, as a result of its reform, the consigner will be able to deliver cargo from any corner of the country to anywhere in the world using convenient and fast routes and using large hub airports. Thus, the task of identifying airports that can become hubs (the airline hub — airports that are used by an airline or airline alliance as a point of concentration of freight traffic and have a high percentage of connecting flights) has particular relevance.

At the same time, the airport and its services are not a separate building, occupied only with the transport of passengers, it is an active participant in the economic life of the city and country [3]. The scope of airport activities includes passenger, baggage, cargo and mail transportation, maintenance of aircraft flights and crews. Airport activities are carried out in the interests of passengers and other customers - consumers of air services, as well as subjects of the air transport market, directly carrying out air transportation or contributing to their implementation [4].

In most cases, hubs are the largest airports in various countries. Also, such concepts as “hub airport”, “transfer hub” are often equated with the concept of a hub. Hubs are the so-called component of the fan route network, which connects the air transport with the ground transportation system, where docking of domestic flights with international ones takes place. Hubs are a profitable investment area. Thus, commercial development in this area makes it the

main generators of urban growth, as it itself becomes important points of employment, trade and business, thereby attracting even non-aviation commercial activities [5].

In order to improve the leadership positions in the Far East within the framework of the aviation hub, the modernization of the Khabarovsk “Noviy” airport is of great strategic importance. Khabarovsk (as part of the urban district of the same name) is the largest transport hub of the Russian Far East, along with Vladivostok. By the end of 2016, in terms of passenger traffic, the Khabarovsk “Ne” airport took 16th place among Russian airports (1.795 million people / year), while Vladivostok Airport “Knevichi” took 14th place (1.892 million people / year) [6].

Considering the fact that the Knevichi airport in Vladivostok has difficult climatic conditions, as part of its operation, the frequency of poor visibility is increased, the Khabarovsk “Noviy” airport can more effectively act as a transit hub.

Within this, a number of advantages are seen: the gross domestic product (GDP) is increasing, new jobs are being created, investments are being attracted to the Khabarovsk Territory; provides linkage of freight with remote and global markets; goods are provided related to the needs of the local market. Therefore, the main directions of development of the transport complex of the Khabarovsk Territory, allocated at the regional level, are included in the State Targeted Program “Development of the transport system of the Khabarovsk Territory” [7] for the period 2013–2020. and “The strategy of social and economic development of the Khabarovsk Territory for the period up to 2025” [8].

Hub is beneficial for both consigners and consignees because they receive: more direct flights for sending and receiving goods; delivery time and mail; greater choice of destinations.

Hub provides airlines with the following benefits: an increase in the frequency of flights; reduction of market risks due to the preservation of cargo traffic in its route network; expansion of flight network with reduced cost.

For airlines, as key participants in the transportation process, the cost of servicing at the airport has great importance in the formation of the cost of the flight. Carriers, seeking to minimize costs and reduce the cost of air travel, are interested in keeping aircraft in the air as long as possible: in this case, the maximum possible load factor is ensured, better coordination of aircraft movement, crew raids and maintenance schedules.

To achieve this goal, many airlines are interested in cooperation with airports operating on the “Hub and Spokes” air communication system, which allows concentrating cargo traffic from different points of departure at hub airports (hubs) for their further redistribution to different destinations.

In addition, today, South Korea’s international airport in the city of Seoul is heavily loaded, and as a result, the competent organization of the Khabarovsk “New” airport makes it possible to secure air transport and partially unload the South Korean airport “Inchon”.

Today, most large hubs are developed by based airlines, often national airlines as well. For example, Frankfurt and Munich were developed by Lufthansa, Zurich - SWISS, London - Heathrow - British Airways, Amsterdam - KLM Royal Dutch Airlines, Sheremetyevo - Aeroflot - Russian Airlines, AirBridgeCargo, etc. A necessary condition for becoming a hub is a strong based airline with a stable financial position [2].

Conclusion. Reconstruction and modernization of the Khabarovsk airport has fundamental importance for maintaining and strengthening the status of the Khabarovsk Territory as an economically and humanitarially open territory [9]. Nowadays, the reconstruction of the Khabarovsk “New” airport continues.

As a result of the reconstruction, the Khabarovsk airport will be able to fully implement the functions of the hub and will be able to act as an air transport hub not only at the regional, but also at the national as well as international level.

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