UDK 656.2

Fedanov N.S.
graduate student
Ural State University of Railway Transport
Russia, Yekaterinburg

FEATURES OF CONSTRUCTION AND OPERATION OF NORTHERN LATITUDE MOVE

Annotation: the article is devoted to the construction of railways in the conditions of the Northern latitudinal railway. The features of the operation of railways in these conditions are considered. The expected socio-economic effects from the implementation of this project are given.

Key words: Northern latitudinal way, operation of railways, the Far North, deformation of the road bed, snow draft.

Rail transport is of particular strategic importance for Russia. It is the connecting link of the unified economic system, ensures the stable operation of industrial enterprises, the timely delivery of vital goods to the most remote corners of the country, and is also the most accessible transport for millions of citizens.

Russian Railways is one of the world's top three railroad companies. Based on the results of its work in 2018, Russian Railways JSC set a historic record in freight turnover. The peak value of traffic volumes was in 1988. This record was improved by 2.5% in 2018. At the same time, the share of railway transport in the freight turnover of the Russian transport system approached 88%, which is the maximum figure for the last 15 years.

According to O.V. Belozerov, Director General of Russian Railways, such results were achieved thanks to systematic work to improve the technology of the transportation process and improve production performance. The head of

the company also predicted that this year cargo turnover will increase by 4%, loading - by 2.2%, export traffic through Russian ports - by 4.1%.

However, despite the large number of positive aspects, the railway transport in Russia has significant disadvantages. The main points include obsolete fixed assets of railway transport, lagging behind the advanced countries of the world in terms of railway technology, uneven development of railway infrastructure in Russia, and more.

In this regard, the Strategy for the Development of Railway Transport in the Russian Federation until 2030 was developed, the implementation of which should solve the main problems in the field of railway transport. One of the important projects within the framework of this Strategy is the construction of the Northern Latitudinal Railway in the Yamalo-Nenets Autonomous Okrug (YNAO).

The project "Creation of a northern latitudinal railway line "Obskaya - Salekhard - Nadym - Pangody - Novy Urengoy - Korotchaevo" and railway approaches to it" is one of the main projects for the development of the natural resource potential of the Arctic zone of Russia, since this area is concentrated main explored reserves and forecasted hydrocarbon resources of the country.

The project is supposed to form a railway corridor connecting the Northern and Sverdlovsk railways of JSC "Russian Railways", parallel to the existing "southern" route for transporting goods along the Trans-Siberian Railway, which passes through the Tyumen and Sverdlovsk railway junctions. This will partially unload these nodes, the throughput and transportation capabilities of which are practically exhausted.

The expected macroeconomic, socio-economic and geopolitical effects of the project are as follows:

• organization of infrastructure, in the future an important component of the development of the Arctic and Subpolar Shelf;

• reducing the length of transport routes from fields in the northern regions of Western Siberia to the ports of the Baltic, White, Barents and Kara Seas by 700 km or more, accelerating the turnover of goods and containers (tank wagons) by consignors;

• optimization of the load on the railway network of Russian Railways;

• acceleration of goods movement and reduction of transport costs in the economy;

• stimulation of further geological exploration and development of new deposits of minerals (oil, gas) in the Yamal-Nenets Autonomous Okrug (YNAO);

• creation of new jobs not only in railway transport (an increase of more than 1500 people), but also in related industries.

The construction of the Northern Latitudinal Railway will take place in permafrost conditions, therefore this project is assessed as the most difficult in the history of the country. The project is unique in its harsh natural and climatic conditions, which are comparable only to Alaska.

The peculiarities of the operation of the railway in these conditions include deformation of the roadbed due to the degradation of permafrost. More than half of the territory of Russia (65%) is located in the permafrost zone, characterized by the natural permafrost state of soils.

This circumstance necessitates constant work to correct the track, causes restrictions on train speeds, significantly increasing operating costs.

The main reason for these deformations is the warming effect of the subgrade construction on the frozen basement soils, which, when thawed, become weak, not taking the load. The most common type of deformation of the subgrade in permafrost conditions is the sedimentation of embankments on the bases, composed of icy soils.

Thus, when designing an earthen, changes in heat exchange conditions should be taken into account and predictive calculations of the position of the permafrost should be performed.

When operating railways in the Far North, there is a risk of erosion of the roadbed in spring. Currently, significant resources are spent on strengthening the subgrade from erosion. If cheap materials (rock fill, turf) are used to protect the subgrade from erosion with a low water flow rate, more expensive materials are used in those areas where the water flow rate exceeds 2 m / s.

Another problem of the railway in the permafrost regions is the high snow load. At present, natural forests, forest plantations (live protection), portable lattice shields, lattice fences and over-slope shields are used to protect tracks from snow drifts.

Natural forest and woodland plantations also protect trains from cross and head winds, thereby reducing the resistance to movement. In addition, they provide protection of the track from the wind, thereby improving the working conditions for railway workers, since another problem in the construction and operation of railways in the Far North is the unfavorable conditions of work outdoors in winter.

Based on the described problems, it can be concluded that the construction project of the secondary SHH is rightfully considered one of the most complex projects in the history of Russia. To implement it, it is necessary to develop a set of technical and technological solutions, taking into account all the features of the terrain and climate in the construction zone, but in the end it will bring invaluable benefits to the economy, population and the country as a whole.

References:

1. Официальный сайт ОАО «РЖД»: [Электронный ресурс] – Режим доступа: http://rzd.ru

2. Кобылкин Д. Н., Лёвин Б. А., Шепитько Т. В. Создание эффективной транспортной системы в арктической зоне России: проблемы и перспективы // Механизация строительства. – 2014. – № 4. – С.4–7.

3. Вылиток А. В. Особенности сооружения новой линии в Арктической зоне // Путь и путевое хозяйство. – 2014. – № 6. – С.27–29.