

Non-Divisional Management Structure as One of the Most Important Elements of the Reform of Railway Transport

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Abstract—At present, large-scale structural transformations are being carried out in railway transport, which fundamentally change the existing mechanism of its functioning and form a new ideology of the industry, the transport market and new relationships between market participants. The features of the reform are not only changing the form of ownership, but also changing the entire management architecture of the company.

Keywords—structural transformations, railway transport, economic management methods, non-divisional management structure.

I. INTRODUCTION.

A radical economic reform, the restructuring of the economic management mechanism, and the transition to economic management methods change both the structure of industrial enterprises and their functioning environment. The history of railways has more than 180 years. For this significant period of time there have been dramatic changes in the development of the railway industry.

The divisional structure of the railway industry management was formed in the 50s of the last century. Bringing its leadership closer to grassroots linear enterprises, it reflected the level of engineering and technology, the state of information and technical controlling means of that time. In conditions of relatively low transportation speeds, the prevalence of steam traction and the attending infrastructure, the weak development of automated control systems, the railway - railway divisions - linear enterprises were an important and necessary element of effective management.

With the beginning of market transformations in Russia in the 90s, a search of new organizational forms of management was underway on railway transport. Its task was to adapt railway transport to new economic conditions. This work was carried out both at the level of the railway industry as a whole and at the economic level unit (the road) and its structural divisions.

For the first time on the road network, the reorganization of the management system and the transition to a non-divisional structure were implemented on the East-Siberian Railways in the 90s. This long-term and successful experience needs multi-lateral consideration today.

II. RESULTS.

By the mid-1980s, the Irkutsk region became one of the most important industrial regions in the East of the country. It

was the area of the implementation of the largest programs of state value.

In terms of industry evolution, degree of development of natural resources, specialization and concentration of industrial production, the Irkutsk region is ahead of most regions of Siberia and all regions of the Far East, and by the main indicators (labor productivity and production per capita) significantly surpassed the corresponding data for the USSR as a whole RSFSR.

The key role in the industry of the region was played by the fuel and energy complex using the unique hydropower resources of the Angara and large reserves of cheap energy coals of the Irkutsk basin. The electricity in the Irkutsk energy system was developed with the best technical and economic indicators in the USSR and the world. As a result, the cost of electricity in the second half of the 1980s was 3-4 times lower than the average one, heat energy was 2 times lower [1]. Therefore, the profitability of the production of the main energy-intensive products of the non-ferrous metallurgy, pulp and paper, and chemical industries was higher than the average in the Union. Powerful and highly efficient fuel and energy, raw materials and water resources of the Angara region also provided an extremely high concentration of industrial production. Bratsk and Ust-Ilimsk Hydroelectric Power Plant, Bratsk and Ust-Ilimsk Timber Industry Complex, Angarsk Petrochemical Plant, Bratsk Aluminum Plant, chemical plants in Ussolye-Sibirskiy and Sayansk, Angarsk electrolysis and chemical plant, etc. were among the largest energy and energy-intensive industry enterprises in the country (and partly even in the world).

In the sectoral structure of industry in 1985, the first place was occupied by forestry, woodworking and pulp and paper (20.9% of the total production), the second place was occupied by the fuel industry as a part of the refining and coal industry (17.4%), electric power industry was at the third place (14.6%), mechanical engineering and metalworking was at the fourth place (13.1%), non-ferrous metallurgy as a part of aluminum and gold mining (10.7%) was at the fifth place [1].

By the mid-1980s the Irkutsk region had a powerful construction sector, which made it possible to create basic industrial enterprises and new cities - Angarsk, Shelekhov, Bratsk, Baikalsk, Zheleznogorsk-Ilimsky, Ust-Ilimsk, and Sayansk. In 1985, the volume of capital investments in Priangarye was 2.2% of the similar value of the RSFSR, the volume of construction and installation work was 2.3% [2].

Large construction organizations as Bratskgesstroy, Angarsk management of construction, Vostsibstroy, Irkutskpromstroy, etc. worked in the region. So, the activities of Bratskgesstroy, which built production facilities from Smolensk in the West to Neryungri and Khabarovsk in the East, had no analogues in scale not only in the country, but also, perhaps, in the world.

The orientation of the region to industrial production was accompanied by intensive development of transport. The vastness of the territory of the Irkutsk region, its remoteness from the main economic centers of the country and the world, the uneven settlement and development, the presence of a powerful industry with a great need for transportation of mass raw and grocery goods stipulated an increased role of transport and communications, which, taken together, occupied second place (after industry) in 1985 in the value of fixed assets and the number of people employed in the regional economic sector [3].

There were major mainlines of all-union significance passing through the territory of the Angara region — transit Trans-Siberian (Transsib) and Baikal-Amur (BAM) railways, the Moscow Automobile Route, inland waterways, main airlines, and oil pipelines.

The East Siberian Railway, East Siberian and Lena River Shipping Companies, whose activities extended beyond the region, were among the major transport associations.

The vast majority of transport work accrued to the Trans-Siberian Railway, which mastered a huge flow of transit and its own cargo and passengers. The freight traffic density in the section from Cheremkhovo to Shelekhov was several times higher than the average network and one of the highest in the country and the world [4].

During this period the main indicators of the activities of the East-Siberian railway in 1988-1990 are reflected in table 1 [5].

TABLE I. DYNAMICS OF THE PERFORMANCE INDICATORS OF THE EAST-SIBERIAN RAILWAY IN 1988-1990

Indic. name	Unit of measur.	1988	1989	1990
Cargo dispatch	bln. tons	3,7	4,1	3,9
Freight turnover	bln. tariff t-km	141,3	140,9	142,1
Passenger turnover	bln. pass. - km	5,4	5,5	5,7

Along with this, there were serious problems in the transport activities.

In the second half of the 1980s railway transport barely coped with the rapid growth in the volume of transport of bulk

goods. By this time, the reserves obtained after the radical reconstruction of the railways with their transition to electric traction had been almost completely exhausted. The task of increasing the carrying capacity of the Trans-Siberian Railway was partially solved by switching to driving heavy trains, routing traffic and implementing other organizational and technical measures [6].

In the late 80s, a new course of development was outlined in the country. The leadership of the country officially announced the transition to the so-called restructuring in 1985, but the first real changes in the economy began only in 1987–1988, when they began to encourage self-employment, create cooperative societies, introduce self-financing at enterprises, and partially decentralize foreign trade. In subsequent years, dollar was released into free circulation in the country with its exchange at the commercial rate (1989), non-state commercial banks appeared with an arbitrary setting of the refinancing rate, or interest from loans (1990), contractual prices for many types of products began to be established (1991).

In the Irkutsk region, sustained economic growth was still maintained. The greatest for the entire Soviet period, the volumes of production of industrial and agricultural products, investment in fixed assets, transportation of goods, etc. were achieved in 1989. In late 1991, the Soviet Union collapsed.

With the transition to market conditions of management in the 90s in all major branches of material production in Priangarie there was a decline, which intensified due to the beginning of price increase and disorganization of state planning and economic management. Thus, in the industry of the region with respect to the most successful 1989, the decline in production in 1990 was 3.5%, and in 1991, already 7.8%.

During the 90s, an unprecedented decline in industrial production in the Irkutsk region continued: its volume in 1994 decreased by 41%, compared with 1990. But in the whole country this decline was even sharper - by 49%. The construction complex of the Angara region suffered the greatest damage: over the same period, the volume of investments in fixed assets decreased by 66%, the commissioning of residential buildings decreased by 60%. Slightly less than in industry, there was a decline in production indicators (transportation of goods and passengers) in transport. The decline in agriculture was less: about 14–15%.

After 1990 there is a decrease in the main indicators in the transport industry, which is explained by the political and economic processes in the country preceding the collapse of the USSR and the transition to market economy conditions [7]. The dynamics of the performance indicators of the East-Siberian Railway during this period is shown in table 2.

TABLE II. DYNAMICS OF THE PERFORMANCE INDICATORS OF THE EAST-SIBERIAN RAILWAY IN 1991-1996.

Indic. name	Units	1991	1992	1993	1994	1995	1996
Cargo dispatch	mln. tons	1 0 3 , 2	9 0 , 5	7 5 , 6	6 4 , 3	6 0 , 9	5 3 , 1
Freight turnover	bln. tariff t-km	1 2 4 , 4	1 0 5 , 9	8 8 , 2	6 7 , 4	6 2 , 6	6 8 , 6
Passenger turnover	bln. pass.- km	5 , 7	6 , 7	7 , 4	6 , 5	5 , 6	6 , 5
Service speed	km/h	4 2 , 4	4 2 , 6	4 4 , 7	4 4 , 8	4 4 , 1	4 4 , 8
Average weight of a freight train	tons	3 0 1 2	3 0 0 9	3 0 6 9	3 1 8 4	3 2 1 7	3 3 7 7
Locomotive performance	thousand t-km	1 2 9 0	1 2 8 2	1 3 9 2	1 4 3 0	1 4 3 2	1 5 2 0
Rail car performance	t-km net	1 0 8 2 8	1 0 7 2 3	1 1 3 4 7	1 1 5 2 5	1 2 1 8 1	1 3 5 8 5
Labour productivity	ths. equated t-km / person	2 5 9 1 , 2	2 2 8 4 , 5	2 0 1 8 , 8	1 6 9 5 , 9	1 5 7 1 , 2	1 4 5 5 , 7
Prime cost of transportation	rub.	0 , 1 0 8	2 , 1 4 9	2 5 , 9 6 3	1 5 2 , 5 1 8	4 2 9 , 8 9 9	6 2 2 , 1 0 1
Revenue	bln. rub.	-	2 , 2	8 7 , 2	5 3 7 , 7	8 6 2 , 8	4 9 3 , 3
Profitability	%	-	8 , 2	3 4 , 3	4 2 , 7	1 0 , 7	1 0 , 9
Number of employees of the primary activity	person	8 2 5 2 2	8 2 8 6 1	8 2 6 0 2	7 9 6 4 5	8 1 7 3 2	7 8 4 3 4

In the railway industry, the current economic situation in the country led to fundamental changes in its development. The organizational and managerial economic mechanism of the railway operation until the year of 1990 was carried out within the framework of the planning and administrative system on the basis of the state transportation plan for the railway industry, which was of a prescriptive nature. These plans linked suppliers and carriers of goods at the economic, industry and road levels, and were provided with the necessary resources through a system of planned financing and material and technical supply. The economic and legal status of management was cost accounting, combining central planning and goods/money relationships, creating certain conditions for the economic independence of the railway and ensuring its stimulation and development depending on the fulfillment of planned targets and the profitability level.

With certain advantages (guaranteed communication of suppliers and carriers, financing and logistics), this economic mechanism was characterized by a number of significant drawbacks: slow response to technical innovations and dynamics of demand for transportation, cumbersome and slow management decisions, poor quality of transportation services, insufficient incentives to increase productivity and decrease of production costs.

The transition to market relations radically changed both the general economic conditions for the activities of the East-Siberian railway and caused the need to transform its economic organization and management structure. At the same time, both the crisis situations in the country and the long-term inevitable processes that accompany the transition from the planning and administrative management system to market environment intertwined in the conditions created during the market reform.

With the beginning of reforms in the '90s, the East-Siberian

railway was put into new fundamentally changed conditions [8]. The directive binding of suppliers to carriers ceased. Suppliers of goods gained freedom in the choice of carriers, focusing on the quality of transport services and on the transport market conditions. Centralized funding from budgetary sources significantly reduced, funding for material and technical supply was cut off. The railway sector was forced to acquire the necessary financial resources and the necessary products of subcontractors only on the basis of its economic activity at market prices.

As a result of the reorganization of economic relations and the deterioration of the financial situation of enterprises, their effective demand for transportation decreased. In 1992-1995 this demand fell almost by half.

The reduction in traffic volumes resulted in a decrease in sources of income replenishment for the railway. At the same time, prices for the necessary and consumed expensive products increased sharply. The dynamics of their increase went ahead of the dynamics of increase in the railroad tariffs. The situation was aggravated by inflationary processes in the economy, non-payments, the rise in the labor cost. The procedure for settlements with the state budget, relations with the central bodies of state power and its subjects, and the taxation system changed. All these factors caused a sharp disproportion between the railway income and its operating costs [9]. The unfavorable economic and financial situation in the railway sector was aggravated by the need to maintain a significant amount of social infrastructure on the railway under different conditions.

The above circumstances set challenging tasks for the East Siberian railway. They were, on the one hand, to maximally ease the negative economic situation on the railway (ensuring the sustainability and efficiency of the railway sector under these conditions, its "survivability"), and on the other, to look

for promising activities and incorporation forms, corresponding to management market conditions.

The search for new incorporation forms of management was carried out both at the level of the railway industry as a whole, and at the level of economic sector: the railway and its structural divisions. For the first time on the railway network, this principle of operation was applied to the East-Siberian railway in the 1990s [10]. On the East-Siberian Railway, a management reorganization plan was developed on the initiative of the railway governing body and its services.

At the initial stage of the transition to the non-divisional management structure the following main directions were identified:

- to divest the railway structural units of their legal status;
- to create railway transport service centers (RTSC);
- to centralize traffic management (CTM);
- to reassign linear enterprises of the railway division to the railway management services;
- to reassign the social sphere of the railway division to the railway personnel department;
- to introduce new information technologies;
- to establish regional offices and railway branches;
- to reduce railway divisions;
- to improve financial and economic relations in the new conditions.

The combination of these activities constituted an interconnected complex, the purpose of which was to create a railway management structure that is appropriate to market conditions. At that, with all the importance of technical factors in the search for new forms of economic activity of railway transport, priority was primarily given to economic factors.

Firstly, it was the need to improve the efficiency of transportation by increasing service speed, reducing interdivisional joints, speed of traffic management [11]. This created the prerequisites for saving rolling stock, labor, and other operating expenses, increasing the attractiveness of transport services for customers [12].

Secondly, it was the need to reduce a significant number of excess work forces and the volume of property, providing the main activity and formed in the railway sector under other economic conditions [13]. While reducing traffic volumes and maintaining the same management structure, these excess resources significantly reduced the profitability of the railway, worsening its financial and economic state.

Thirdly, with excessive production capacity, significant costs for financing the social sphere continued.

Fourthly, the management structure established under the planning and administrative system did not allow efficient transportation operations in market conditions.

Thus, it was necessary to establish a new, market-based railway management organization, enabling it to compete with

other providers of transport services and to use the benefits of market management.

The winding-up of divisions as a railway management unit was only a stage and one of the links in the implementation of a set of measures to form a market economic structure for the railway management. Without preliminary stages and other parts of the East-Siberian railway management reform, a transition to a non-divisional management structure would be impossible. The preparatory stage of this transition was important and in many respects preconditioned both the transition process and its principal directions.

The need to solve the set of tasks and directions predetermined the need to form an actually new, market structure for the railway management, both in terms of legal and economic structure, and in terms of production and technological organization.

Technological factors were determined by the modern technical base [14] and effective means of processing and transmitting information that had been existed on the railway at the previous stages. And this, in turn, created the technological prerequisites for the centralization of the production transportation process with a lot of benefits with respect to the technical and economic characteristics of the use of rolling stock.

To this end, a single railway transportation control center was established on the East-Siberian Railway in Irkutsk, which made it possible to more rationally establish the dispatching "Circles" and create ten of them instead of sixteen. This was possible only on the basis of the widespread introduction of computer science, computer technology and telecommunications.

The next stage in the transition to a non-divisional management structure was to improve the relationship with clients. For this purpose, a unified railway transportation service center (RTSC) was created on the East-Siberian railway as a service agency.

Much work was done in parallel to equip the railway with up-to-date means of communication and modern means of automated data collection and processing and control, to reorganize all management activities based on the mainstream use of information technologies, to create automated information systems increasing the efficiency of the production [15], economic, financial and social structures of the railway.

A single information space has been organized to ensure the centralization of transportation management, transport customer service and the financial and economic center on the railway. In each structural subdivision, local computer networks are created, which include workplaces of an accounting and economic group, as well as production and technological automated working stations.

A single database is created in the divisions, which includes problems of economic, economic, financial and production activities. Through a data transmission system built on the basis of information concentrators, local networks of enterprises are combined with the corporate computer network of the railway management. This network includes all the railway network

management, information-computing center, operational control center, transport service center, automated centralized accounting.

Due to the transition to the new conditions of the operation for railway enterprises, relying on the ensuring controllability principles, all the railway production structural divisions according to branch principle are subordinated to the branch services, which are reinforced by economic professional employees.

The production structural subdivisions that are part of the services were divested of the status of a legal entity, current accounts in banks, a complete accounting system, and carried out their activities by the principles of internal economic accounting.

In this regard, the organizational and legal status of a legal entity was left only for the railway. Its activity is based on full-scale cost accounting. All other structural subdivisions of the road lose their status as a legal entity and operate on the basis of internal production cost accounting.

In order to enhance the efficiency and accuracy of financial and economic calculations, the flexibility to take into account the changing situation and its reflection in financial and economic plans, effective monitoring of their implementation, as well as for the purpose of comprehensive accounting and control over the movement of material resources, the Financial and Economic Center was created as part of the financial and economic services.

When switching to a non-divisional management structure and centralizing management processes, the status and functions of railway management, the status and functions of its services, change significantly. The new economic mechanism of the East-Siberian railway is based on the following principles.

The railway is the main element of a single complex of railway transport. It operates by the principles of full economic accounting: economic independence, self-sufficiency, self-financing, material incentives and control.

An important direction during the transition to a non-divisional management structure was creating representative offices and branches on the railway (based on the wound up divisions) that represent the interests of the railway sector in the subordinate entities of the Federation. The representative offices and branches have the status of structural divisions of the road, are endowed with the necessary property for their activities, and are funded by estimates approved by the railway. They have current accounts and other ones in banks, have their corporate seal and stamp.

The experience of the non-divisional management structure of the East-Siberian Railway formed the basis of a new ideology in the work of railway transport. In 1997, the extended Ministry of Railways Collegium was held in Irkutsk, which recommended the experience of the railway sector for distribution and implementation throughout the network.

III.CONCLUSION

The East Siberian Railway has made the most significant progress in the practical transformation of the structure of managing its activities, caused by market requirements. The work carried out on the railway to centralize management functions during the transition to a non-divisional management structure was an experimental ground for testing important elements of the industry management structure reform as a whole in the new economic environment.

In modern conditions, a new development strategy for a non-divisional management structure in the industry is based on the technology of centralized transportation management in cooperation with the directorates of traffic, traction, infrastructure and sales. Each of which will be responsible for its part of the company's business. Subsidiaries and sectorial directorates are established. But in order to give transport the opportunity to work in a new way, it is not enough to create directorates and subsidiaries. It is necessary to revise the regulatory framework, make it more flexible and define the rules of the interaction on the transport services market - in short, build logistics.

There is also a need to carefully count and weigh each transformation in order not to lose the railway transport functioning stability.

The main tasks are to organize and control the transportation process and commercial work in the field of freight transportation, and to form a unified technical policy in the field of cargo and passenger transportation in accordance with the strategies of the technical and technological development of the Company.

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