

CLASSIFICATION OF TECHNICAL AND ECONOMIC INDICATORS OF THE OPERATIONAL ACTIVITIES OF JSC “UZBEKISTAN RAILWAYS”

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The operational activity of railway transport refers to the production activities of all railway enterprises and structural units involved in organizing and implementing the transportation process. The operation of the railway integrates all its elements and systems.

The operational activity of the railway includes the following areas:

- **Technical standardization** – developing monthly standards for train and freight operations to meet a specified volume of freight and passenger transportation, and for future transport planning;
- **Operational planning** – ensuring efficiency under real-time operating conditions;
- **Regulation of the transportation process** – ensuring stable operation of all departments and adherence to technical standards;
- **Train traffic dispatching** – carried out by a train dispatcher to continuously monitor and manage train movements and shunting operations;
- **Management of the locomotive fleet**;
- **Accounting and analysis of operational activity** – identifying obstacles and shortcomings in transport operations and determining ways to eliminate them.

The main goal of railway operations is to ensure safe train movement with minimal costs while making the most of time and capabilities. For example, maintaining strict standards for the composition of freight trains is essential. However, it is difficult to predict wagon accumulation times in advance, making guaranteed delivery within a specific period challenging.

Accelerating operations sometimes prevents cost savings, and instead may lead to increased expenses. Therefore, under current conditions, managing operational activities should aim to meet transportation demands efficiently with minimal costs.

Characteristics of Operational Activity:

- It is carried out in coordination with various structural units—such as railways, stations, depots, transportation companies, forwarding and logistics firms, etc.—that jointly execute the transportation process.
- The production process begins within one railway and continues across other railway enterprises. Unlike in other industries, not only the objects of labor (cargo) but also the tools of labor (wagons and locomotives) are transferred.
- Locomotives are assigned to specific depots and return there. However, the operational routes of locomotives often cross railway boundaries, leading to challenges in cost assessment and reimbursement between networks.
- Wagons, on the other hand, circulate across multiple national railways. Hence, there is a specific need to regulate wagon fleets.

Types of Railway Operational Activity:

- **Technical operation** – includes train movement organization, station design and operation, and passenger transport organization.
- **Commercial operation** – includes organizing freight and commercial activities and delivering quality services to customers.

To describe the rolling stock, determine the need for material, financial, and labor resources, and assess the requirement for locomotives and wagons, the railway uses both volume and quality indicators of operational work.

Volume indicators are divided into the following groups:

1. Indicators reflecting completed work cycles.
2. Indicators reflecting distances traveled by rolling stock.

3. Indicators reflecting the time spent by wagons and locomotives.

Table 1

Distribution of Volume Indicators by Groups

Group Name	Names of Indicators in the Group
Indicators Reflecting Completed Work Cycles	Number of Loaded Wagons Number of Wagons Received from and Delivered to Adjacent Railways Station Activity is Determined Not Only by the Number of Loaded Wagons but Also by the Number of Unloaded and Processed Transit Wagons
Indicators Reflecting the Distance Traveled by Rolling Stock	Distance Traveled by Wagons Distance Traveled by Locomotives
Indicators Reflecting the Time Spent by Wagons and Locomotives	Time Spent by Wagons Time Spent by Locomotives

Table 2

Distribution of Quality Indicators by Groups

Group Name	Names of Indicators in the Group
Indicators of Rolling Stock Utilization Based on Train Capacity, Wagon Load Capacity, and Locomotive Tractive Effort	Poyezdning o'rtacha og'irligi (brutto, netto); Vagonning o'rtacha yuklamasi (statik, dinamik);
Indicators of Rolling Stock Utilization Based on Time	Train and Locomotive Movement Speed (Sectional, Technical) Average Dwell Time of Wagons at Freight and Technical Stations Average Dwell Time of Locomotives at Depots Average Daily Distance Traveled by Wagons and

	Locomotives
Indicators Reflecting the Share of Inefficient Operation of Rolling Stock	Empty Run Coefficient of Wagons Auxiliary Run Coefficients of Locomotives (Solo Running, Idle Time)
Generalized (Synthetic) Quality Indicators	Total Turnaround Time of Wagons and Locomotives Average Daily Productivity (Performance of Freight Wagon and Train Locomotive)

Quality and volume indicators form an integrated system and can be calculated using formulas and ratios. There are two types of formulas used for such calculations:

- **Volume-based**, in which the level of quality is assessed through the amount of work performed using operational standards;
- **Analytical**, in which the indicator is derived from other quality indicators.

The Plan for Rolling Stock Operations in Freight Transport Based on Volume Indicators is Developed in the Following Order:

- Wagon loading by types of cargo is determined, and the number of loaded, unloaded, received, and delivered wagons is calculated; the transport density given in tons is converted to wagons, and the distance traveled by loaded wagons is defined;
- The balance of empty wagons is drawn up by section; empty wagons are allocated to unloading points where there is a surplus, and to loading points where there is a shortage; a route scheme for empty wagons is created, the distance they travel is determined, and finally, total wagon-kilometers are calculated;
- Gross ton-kilometers are calculated by section; the train run distance is determined based on the length of receiving and departure tracks at stations and the standard weight of freight trains;

- The number of paired trains by section, the location of push points and double traction sections are considered to calculate the linear distance traveled by locomotives;
- Based on the volume of wagon processing at stations, the number and travel distance of special shunting locomotives are determined; the number and duration of stops of mixed trains at intermediate stations are used to determine the volume of shunting work by train locomotives;
- Based on sectional data on distance traveled by rolling stock, technical norms of use, and depot and station operation data, the working fleet of wagons and locomotives is determined.

Quality indicators are derived based on volume indicators.

The above stages can be briefly described in the following schematic sequence.

According to the guideline titled *"List of Key Performance Indicators for Main Operations, Rolling Stock Utilization, Labor Productivity, and Cost Calculation Methods"* by JSC "Uzbekistan Railways", the system of indicators is classified into the following groups:

- Volume and quality indicators for passenger and freight transportation
- Volume indicators of technical operations for passenger and freight movement
- Quality indicators of freight wagon fleet utilization
- Indicators of passenger wagon fleet utilization
- Indicators of transport operations and locomotive utilization
- Labor productivity
- Cost calculation

This classification does not describe the procedure or sequence for calculating the indicators, but rather reflects a structured system of all volume and quality indicators characterizing the operational activities of railway transport according to the nature of the operations.