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The Decision of Utilizing Manufacture Houses When the Middle Buffer Has Been Created

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Abstract: *The use of cyclical-flow technology with a multi-link transport system requires rhythmic operation of the quarry, which excludes unproductive downtime of conveyor complexes. However, the use of cars in the system of loading and transport complex, as shown by the experience of both the Krivbass and Muruntau quarries, determines a significant variation in the parameters of cargo flows. This leads to uneven cargo flow entering continuous transport, and, as a result, to a significant decrease in the design performance of complexes with a corresponding deterioration in technical and economic performance indicators. Analysis of the study of dynamic characteristics of cargo flow shows that this process is generally carried out in two modes: stationary and transient (the beginning and end of the shift and the lunch break), which indicates a significant unevenness of cargo flow during the shift.*

Keywords: quarry, buffer, open pit mining, blasting, parallel-close charges, rock.

Thus, with the mathematical expectation of hourly equity participation of 0.124, the real values range from 0.057 to 0.166.at the same time, the average intensity of cargo traffic in stationary mode is 1.5-2 times higher than the value of this parameter in the transition period [1].

In addition, the complexity of the face grades also determines fluctuations in cargo flow [2]. At the same time, the probabilistic distribution of the cargo flow of overburden by shifts is characterized by a coefficient of variation of ± 18-19 %.

Thus, with a certain mathematical expectation of the average hourly value of cargo flow, which determines the throughput of the transshipment point, ensuring full loading of the conveyor complex, the actual receipt of dump trucks for transshipment in hourly intervals significantly changes. Variation in the parameters of existing cargo flows at the quarry can lead to underloading of conveyor equipment during its negative values, or to the inability to receive a part of dump trucks during peak periods (positive values of variation), which ultimately leads to a mismatch of the parameters of the entire system, and, consequently, the expected volume of work of the conveyor complex [3].

To stabilize the flow of rock mass to conveyor complexes, to ensure the specified productivity, along with organizational measures, it is necessary to choose rational technological parameters of transport and transshipment complexes, as well as to make special technological decisions [4].

These include, first of all,:

1) rational organization of preparatory work - changing drivers, maintenance, refueling, which allows virtually eliminating zero runs of dump trucks, which will speed up their exit to the line;

2) choosing a rational number and type of transfer points from dump trucks to the conveyor, which are the main link in the relationship of combined modes of transport;

3) a device near the transshipment point (or on the surface) of a buffer intermediate warehouse, the parameters of which are determined based on the characteristics of the cargo flow of vehicles.

Rational organization of preparatory work for vehicles will speed up the saturation of the traffic flow at the beginning of the shift, but can not exclude the irregular operation of vehicles during the shift [5].

The analysis of the obtained data shows that the choice of a rational number and type of transshipment point also cannot fully solve this problem, since the volume of the hopper in most cases is equal to 2-4 capacity of dump trucks.

To completely eliminate the influence of variation of the intensity of quarry cargo flows to work the conveyor line, stabilize the load, as shown by studies on simulation models, as well as the practice of career Muruntau", possibly by creating an intermediate buffer store about transhipment point, which not only compensates for the effect of variations in traffic, but will also serve as a storage container when unforeseen downtime of the conveyor complex [6].

For the development of technological schemes of buffer temporary warehouses at the quarry at the CPT, justification of their design and technological parameters, a classification of such warehouses has been developed (table 3.1).

The systematization is based on the principle of satisfying the technological conditions for the completeness of loading of the conveyor complex of the CPT during non-rhythmic operation of cyclical road transport.

Table 3.1 Classification of basic technological schemes intermediate buffer temporary warehouses

Warehouse type	Loading the warehouse	Shipment from the warehouse	Technological satisfaction conditions
Storage on a ledge	motor transport	backhoe, backhoe with downhole (warehouse) conveyor	yes
Storage in a special recess (warehouse-transshipment point	motor transport, modular reloading points with a reloader	feeders, conveyor, reloading to the bottom-hole (warehouse) conveyor	yes
Storage in a trench	modular reloading systems points with a loader	feeders to the lifting conveyor	yes

Let's consider technological schemes, design parameters and economic efficiency of the least expensive buffer warehouse when storing on a ledge inside the working zone of the Muruntau quarry. Loading of such warehouses is carried out by road in case of accidental unexpected stops of conveyor complexes, overflow of cargo traffic going to the transshipment points of the Central processing center, as well as planned, preventive repair works (each complex is 7 days monthly).

Roller-free conveyor), such conveyors can transport ordinary rock mass without the usual pre-preparation of rock mass on the CL. -300 mm. In addition, due to a certain temporary shipment of rock mass from the warehouse, it is advisable to use mobile loaders as loading equipment in such warehouses, rather than excavators of the EKG type. Reloading points at the site of ledges require a certain area for storage of the rock mass. In this case, when they are formed in the working area of the quarry for these sites, either the acceleration of the quarry Board or temporary zatselichivanie is required. The latter is accepted in the practice of the Muruntau quarry.

Thus, based on the analysis of the receipt of rock mass in the buffer warehouse during the practice of the quarry during 2013-2014. it is established that such a warehouse should have a maximum volume of receiving capacity equal to 220 thousand.m^3. At 15-30 m height of the ledge when forming a warehouse to provide such a volume of buffer warehouse, the required warehouse area must correspond to 14.6-7.3 thousand m^2. The use of compensating buffer warehouses at the quarry allowed to increase the productivity of conveyor transport and dump complexes by 30-39%.

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