N.A. Minyajlo, associate professor, c.t.s.

ANALYSIS OF WORK FOR CAR DUMPER ON ORE YARD METALLURGICAL PLANT

Zaporozhe state engineering academy, Ukraine

It is executed the analysis of supplies of raw material on a metallurgical plant. It is appraised the estimation of work-load of car dumper at unloading of railcars and reasons of it standing idle on ore yard. On the basis of the got results there are formulated possible directions on the improvement of organization of unloading works on open storage.

Keywords: raw material, supply, ore yard, car dumper, unloading, work-load.

Delivery of raw material from ore mining and processing combines (MPC) to the metallurgical plants is mainly carried out by a railway, conveyer or motor-car transport, also is used the marine and river method of transporting of loads [1]. The choice of method for delivery of raw material depends on the geographical location of MPC in relation to a metallurgical plant, economic expediency of transportations, constructural features of receiving center of raw material, structure of storage.

Unloading complexes of metallurgical plant are a collection of mechanisms of different construction [1,2].

Efficiency of work for unloading complex of metallurgical plants influences on a time, which remains for implementation of technological operations of subsequent areas of preparation of charge. Therefore questions of planning of work of the unloading stations of plants with the purpose of the rational use of technological equipment and decrease of general overhaol time of transport vehicles, providing delivery of raw material are actual.

On open storages with the serve of raw material in railway cars for their unloading car dumpers (c/d) are mostly used [1-5]. By requirements to used c/d are high preparation of charge, possibly less mass, small power and operating charges on unit of the off-loaded materials, by possibility of unloading of railway cars of different dimension type on a width, height and length [3,4,6].

With the purpose of exposure of basic directions on the improvement of planning and organization of works for unloading complex of metallurgical plant on the basis of values of parameters of operating production it is necessary to form the basic algorithm of his work, realize the estimation of reasons of work-load and outages.

The estimation of efficiency for work of unloading complex was realizeed for the conditions of OAJ «Zaporozhstal». A requirement in raw material of this metallurgical combine makes about 21 thousands tonas in twenty-four hours. Unloading of railway cars is carried out by tower c/d in the receiving trench of balancing storage along six basic stacks which are located on outside of ore yard.

Estimation of quantity given in the carriages of every type of raw material on an ore yard showed that his volume can considerably hesitate in the flow of twenty-four hours. Change of quantity for concentrate, which acts on an ore yard, can make from 92 to 219 railway cars in twenty-four hours, sintering ore are from 0 to 110 railway cars, to exterminate are from 0 to 19 railway cars, coke are from 0 to 47 rail-

way cars. Thus common quantity of railway cars, given under unloading in twenty-four hours makes from 200 to 330.

For providing the necessary quantity of raw material for metallurgical regime of work for c/d - twenty-four-hour three-shift. At the pending shift of changing c/d can off-load from 1 to 5 types of raw material with the change of general quantity of railway cars from 60 to 115.

Thus, on a plant certain conformity in the volumes of delivery with every type of raw material in the flow of twenty-four hours, month, year is absents. The common quantity of materials , which is needed for productive necessities is observed only.

For providing of production all kinds raw material for changing c/d can off-load raw material which is given in a different sequence. It ensues from the conducted researches, that the first (in more than 40 % cases) material is give iron-ore materials, second (in more than 50 % cases) fuel or fluxing additions. At correlation sintering ore is a concentrate-blast futnace dust of first a blast futnace dust (in more than 58 % cases) is given, second is a concentrate (more than in 57 % cases) and third is sintering ore (in more than 50 % cases).

Because c/d produces unloading of every type of raw material in a receiving trench opposite those stacks, where this material will be further overloaded, then the sequence of serve of raw material influences at duration of additional moves c/d along an ore yard.

For realization of numerucal experiments on the basis of statistical data parameters which characterize delivery with raw material on an ore yard at the pending shift are chosen. The change of order for serve of raw material was carried out taking into account an existing to date sequence, features of location of stacks on an ore yard and chaotically.

The results of researches showed that at the existent sequence of unloading of raw material, with priority of unloading of at first of iron-ore materials, and after a fuel and fluxing additions, time of moves c/d corresponds to maximally possible and equals time of movement c/d at the serve of raw material casual character, without the observance of the certainly set sequence. Work-load c/d here makes about 52 %. Most rational use c/d observed in the case of successive serve of raw material, which corresponds to the order of location of stacks on an ore yard. At this case additional moves of c/d are not carried out and his work-load goes down on 5 %.

On efficiency of the use c/d also duration and reasons of outages is influences [5]. For the conditions of ore yard for OAJO «Zaporozhstal» standing adles c/d can be conditioned planned preventive repair, greasing of equipment, absence of load, heating in/o.

It is ensues from the results of researches, that to 45 % time of standing adle c/d takes place because of absence on the ore yard of loads. 21,3 % of work time is spent on heating of mechanisms. This index is characteristic only for an autumn-winter period. Time of standing adle c/d by reason of his repair is the least, that talks about the high degree of his readiness to work.

Thus, analysis of existent fegime of work for c/d showed that for providing of metallurgical plant by raw material a given quantity work-load c/d taking into account implementation of technological and technical works to date сотавляет

63,5 %. 45 % of work time for c/d stands for lack of loads, that testifies to subzero organization of works with delivery on planning of delivery with raw material on a metallurgical plant. Additionally for the increase of efficiency of the use c/d it is possible to decrease time on his additional moves as a result of providing of rational sequence of serve of raw material on an ore yard. In this case work-load c/d it is possible it will be to decrease on 5-10 %.

For clarification of directions on the improvement of regime of work c/d additional researches at joint his work with ore-clamshell faucets are needed.

LIST OF LITERATURE

1. Новожилов М. Г. Качество рудного сырья черной металлургии [Текст] / Новожилов М. Г., Ройзен Я. Ш., Эрперт А. М. – М.: Недра, 1977. – 415с. – Библиогр.: с.409-411.
2. Разгрузочные комплексы производства ОАО «Днепротяжмаш» [Электронный ресурс] // Режим доступа: http://dtsconference.com/pdf/razgruz/ 11.pdf.
3. Васильев Н. Г. Особенности нагружения механизма поворота люльки башенного вагоноопрокидывателя / Н. Г. Васильев, А. Г. Гроховский, А. Ф. Миронов // Черная металлургия. – 1980. – №8. – С.123–126.
4. Егоров В. Ф. Вагоноопрокидываетль с боковой разгрузкой / В. Ф. Егоров, Ш. В. Хамицев, В. П. Прилуков // Известия Вузов. Черная металлургия – 1985. – №4. – С.137–140.
5. Парунакян В. Э. Оценка уровня организационного взаимодействия разгрузочного комплекса и грузовой станции агломерационной фабрики / В. Э. Парунакян, М. Ю. Онищенко // Захист металургійних машин від поломок: зб. наукових праць / ПДТУ. - Маріуполь, 2008. - Вип. 10. - С. 64-72.
6. Механическое оборудование фабрик окускования и доменных цехов [Текст]: учеб.для вузов / В.М. Гребеник, Д.А. Сторожик, Л.А. Демьянец и др. – Киев: Вища шк., 1985. – 312с. – Библиогр.: с. 307.