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NETWORK PLANNING AND MANAGEMENT OF REPAIR PRODUCTION

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The task of operational and production planning is the constant planned management of production, ensuring the rhythmic work of all its links. Production planning and management is greatly simplified when using a network planning and management (NPM) system.

The essence of NPM is that, with the help of a graphic image, a logical model of the process of performing the entire complex of repair works is developed, which establishes the reciprocity of all works in their technological sequence. This model is a network graph that allows you to visualize the progress of work over time, plan the sequence and determine the interdependence of individual operations, monitor the execution of each of them, identify "bottlenecks" and unused reserves in a timely manner, and redistribute human and material resources.

The network schedule allows you to determine what types of work and to what extent the terms of machine repair depend. According to the schedule, those works are determined on which the completion date of the repair primarily depends (the critical path of the schedule).

When building network graphs, two elements are used – work and event. Work means a labor process that requires spending time and resources. The moment each job starts and ends is called an event. Work is indicated by a straight line with an arrow, and an event is indicated by a circle with a serial number.

To develop a network schedule for machine repair, you must have the following data: a list of works performed during the repair of this brand of machine; standard time for each job and the number of workers employed in each job; sequence of works, which must be observed during the repair; annual and monthly repair plans; standard time established for the repair of machines of this brand [1].

Certain rules should be followed when constructing a graph: the direction of the arrows on the graph should be displayed from left to right; no event can occur before all work leading up to that event has been completed; no job can start before the start event for that job occurs; the schedule should be simple, without unnecessary intersections; all events (except the final one) must have the following works; there should be no events (except the initial one) that do not include any work; the schedule should not have closed contours, that is, paths that connect any event with itself; each event number can be in the schedule only once.

The next stage of drawing up a network schedule is its calculation. It consists in determining the early and possible late start of work, early and late completion of work, the duration of the critical path and the work lying on it, as well as time reserves.

By combining events with time reserves equal to zero, the critical path is obtained. The network schedule is considered satisfactory if the critical path does not exceed the regulatory time for machine repair. If the machine repair period according to the schedule is longer than the normative one, then optimization (adjustment of the schedule) should be carried out. To do this, works on the critical path are analyzed with the aim of reducing their duration due to organizational and technical measures, mechanization of work, revision of technology, reinforcement of resources using reserve time on works that are not on the critical path.

References.

1. Дашивець Г. І., В'юник О. В. Застосування метода сітьового моделювання виробничих процесів в інженерних дисциплінах // Удосконалення освітньо-виховного процесу в закладі вищої освіти : збірник науково-методичних праць. Запоріжжя : ТДАТУ, 2023. Вип. 26. С. 47–55.

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