

Use of hydropower plants and its main problems

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Annotation: The use of hydro resources in the article. A number of shortcomings have been addressed and the process has been analyzed. In the process, recommendations have been made to increase energy efficiency.

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Hydroelectric power plants, which combine a complex of facilities and equipment, must ensure the perfect generation of electricity in accordance with the requirements of energy consumers. The power supply must be efficient and, consequently, ensure that all facilities and equipment of the hydropower plant operate without interruption and produce the amount of electricity provided for in the design [1]. Use should be carried out with maximum efficiency. Thoroughness and economy of work are the main requirements for use. These requirements must be taken into account in the design and construction process. The built hydropower plant should be used in such a way that all the requirements included in the project can be fully met. In the design process, the selection and placement of the type of structures and equipment, their design, size and use must ensure compliance with these basic requirements: maximum production efficiency and minimum labor and material costs [2]. In the context of integrated use of hydro resources, similar requirements, such as accuracy and economy, are also applied to the construction of other elements of the water management complex (water transport, irrigation, etc.). The main task of the maintenance staff is to ensure the efficient operation of all its elements in the operation of hydropower plants. The use of facilities and equipment is necessary to ensure the production of the required amount of electricity in the changing hydrogeological, meteorological and other real conditions, when required for the power grid [2]. Typically, this requires obtaining as much electricity as possible from hydropower plants, especially when power supply is important to cover the load peak, so it is important to use structures and equipment in such a way that they are stored in the best possible condition for a long time. and all precautions must be taken to ensure that they are not damaged in any mode of use.

The operation of hydropower plants should be carried out in accordance with the "Rules of technical operation of power plants and networks" [3]. Knowledge of these rules is mandatory for operational staff and is very useful for employees of project, scientific research enterprises. All facilities and equipment are maintained in good condition for a long period of time, without the need for long-term, uninterrupted and more efficient use, and all repairs of facilities and equipment are carried out in a timely and high quality manner. Repair work is divided into capital and current repairs according to its function, scale, timing and financing conditions. Of these, capital repairs are larger, more significant, and relatively more expensive. This is usually due to relatively large damage, and the equipment is associated with the collapse of structures (eg, very cavitation collapse of the turbine, damage to the concrete surface of the dam, grate, dam, washing of the river near the responsible structures, leaks. program subsidence, impediment to the efficient use of hydropower as a result of increased filtration). Major repairs of some elements of hydropower plants are carried out periodically, for example, once every 5-10-15 years, sometimes longer. Current repair is the repair of minor breakdowns of structures and equipment. They are appropriate in cases where the structure and equipment have not yet suffered significant damage.

Carrying out repairs with minimal damage is the most economical and effective way to keep buildings and equipment in good condition. At the same time, of course, the volume of repair work, labor and material

costs will be relatively small. Therefore, current repairs can be carried out systematically and systematically with a constant shortage of manpower, ie in the daily routine of daily work. Preventive maintenance is a special case of current repairs and is the most effective means of maintaining facilities and equipment in good condition, ensuring their thorough and uninterrupted use. In this case, the current inspection of structures and equipment requires careful monitoring of the damage from the very beginning of its formation [4]. Prophylactic repairs (scheduled-warning repairs) carried out in a flat order have led to its high efficiency, ensuring the accuracy of use, becoming the basis of repair work. In many cases, the possibility of more complete use of water and energy resources is of national economic importance [5]. These requirements in the complex use of water resources, hydroelectric power plants depends on the flow and flow rate used for. In the process of design and operation, increasing the flow and flow rates used in hydropower plants will increase the efficiency of power generation, as well as their use in the power grid. Use for this purpose includes:

- ensure full use of flow with hydraulic structures. Losses should be minimized due to non-condensation of water intake and shipping structures and hydraulic turbine transmission equipment;
- In the complex use of water resources it is necessary to try to increase the volume of flow and consumption Q allocated for the production of electricity. Take measures against unjustified increase in the volume of flows allocated for non-energy purposes. This requires effective control by the relevant enterprises of water consumed in shipping canals, water supply to production, irrigation facilities;
- reduction of the amount of water used by the hydroelectric power plant for its own needs from high-rise or inlet water pumps, for example, the removal of garbage from the grid and difficult-to-use waste, washing of tanks and use for technical water supply. Typically, water intake for own needs is 0.25-1.5% of the flow used in a hydropower plant;
- Avoid as much as possible when throwing ice and ice pieces without passing through the turbine, as this will waste part of the flow, so whenever possible, keep the ice pieces through the turbine and keep the ice pieces at a high level. Because melting them increases the flow rate used by the turbine;
- H static pressure as high as possible, ie keep the upper b'ef level as high as possible and the lower b'ef level as low as possible;
- harmonization of the operating mode of the hydroelectric power plant with the operation of other power plants. Typically, this agreement is made on behalf of the dispatching service (usually controlled from the dispatching point), which provides the most convenient hydroelectric power plant operating mode.

Conclusion

In conclusion, it is expedient to improve the use of hydropower plants. This is because the efficiency of hydropower plants is higher than that of small hydropower plants, and high-quality energy can be obtained. Buesa can meet a certain part of the energy needs of the Republic.

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