UNCERTAINTY MANAGEMENT IN HYDROPOWER OPTIMIZATION PROBLEMS

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Hydropower problem characterized by high levels of uncertainty, which is evident at all stages of the information process in the decision management. Therefore, the search for methods and approaches to building effective decisions under uncertainty is an important and practically significant problem. Various hydrological problems with stochastic data studied in stochastic hydrology and hydrological optimization problems are considered in the stochastic programming. Occupy a special place optimization problems with uncertain input data. In a case where input parameters comprise uncertainty used Uncertain Programming. Uncertain programming is a theoretical basis for solving optimization problems under different types of uncertainty.

Currently, many problems under uncertainty are using the concept of uncertainty management, which increasingly appears in russian and foreign publications. The meaning of this concept has not yet been established and is often used along with concepts such as risk management, information uncertainty and so on. Our interpretation of the notion of uncertainty management is primarily concerned with the development of numerical methods and procedures that can help reduce the level of uncertainty depending on the type, nature, specific characteristics, volume and sources of information at all stages of the process, the accompanying management decisions. In an article for solving optimization hydropower problems with random input data is proposed to use the random programming [1,2], which is a section of mathematical programming and numerical probabilistic analysis to construct the probability density function to describe the set of possible optimal solutions for linear and nonlinear optimization problems. Under this approach, implemented procedure of propagation of uncertainty in order to reduce the level of uncertainty. At the end we consider the example of solving the optimization hydroelectric power generation problem, which depends on the prognosis of lateral inflow into the reservoir as a stochastic function.

REFERENCES

1. O. A. Popova *Optimization problems with random data.* — Journal of Siberian Federal University. Mathematics & Physics. — 2013, 6(4), 506–515

2. B. Dobronets, O. Popova *Linear optimization problems with random data.* VII Московская международная конференция по исследованию операций (ORM 2013): Москва, 15–19 октября 2013 г. Труды Том 1 / Отв. ред. П.С. Краснощеков, А.А. Васин, А.Ф. Измаилов. — М., МАКС Пресс, 2013. С. 15–18