



Optimization model of reservoir group real-time multi objective benefit and risk coordination

Jia Wang (1), Xiaohui Lei (2), Xu Wang (2), and Hao Wang (2)

(1) Sichuan University, China, (2) China Institute of Water Resources and Hydropower Research, Beijing, China

In recent years, there are characteristics of the Yellow River Basin are the amount of water resources has been decreasing, the temporal and spatial distribution is changing, and the water characteristics and structure change significantly. In the future, it will face severe challenges of economic development and water shortage. The theory of real time dispatching of reservoir groups in the Yellow River basin should consider risk scheduling. At present, there is less research on the synergistic optimization of risk and benefit in the real-time dispatching of reservoir systems. In this paper, the real-time risk scheduling of the Yellow River water is studied under multi factors disturbance. The real-time risk dispatching model of the Yellow River is constructed, and the real-time scheduling scheme of the Yellow River volume to deal with multiple factors is put forward. Real-time risk scheduling of the Yellow River water under varied perturbations, mainly based on real-time meteorological and hydrological ensemble forecast, to analysis of main disturbance uncertainty characteristics and study all kinds of disturbance probability. reflect the space-time characteristics; analysis of various disturbances in the Yellow River main control section of water shortage risk, put forward all kinds of disturbance of reservoir under the emergency dispatch start condition. At the same time, by analyzing the risk of water shortage in main control section of the Yellow River main stream under various disturbances, proposing the starting conditions for various kinds of disturbed sewer emergency dispatch. Through constructing a real-time and multi-objective coordinated optimization model of benefits and risks in the Yellow River basin, we need study the start-up conditions of emergency dispatching under extreme water and sediment and water pollution scenarios and propose a real-time scheduling scheme for the Yellow River water volume. A set of key technologies for real-time water quantity scheduling in the Yellow River under multiple factors disturbance are formed. The real-time scheduling scheme of water by using the constructed model of reservoir real-time performance and risk collaborative optimization not only can improve water the Yellow River real time scheduling technology level, and the river ecological water level of assurance. At the same time, it can provide appropriate water volume, water quality and flow conditions for the river sediment and water ecological environment, and bring win-win for ecological environment and economic situation.