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Study on flood oriented utilization of cascade reservoirs based on time-varying design flood of inflow

Jiqing Li and Jing Huang

North China Electric Power University, Renewable Energy School, Hydrology and Water Resources Engineering, China (1400110642@qq.com)

The time-varying design flood makes full use of the actual inflow flood peak and flood volume information, providing the scheduling that takes flood control and benefit into account for the reservoir, as well as realizes oriented utilization of flood. And it can be used as the basis for making the operation scheduling of the reservoir. This paper adopts the super quantitative method for flood sampling, using the Poisson process model with time-varying parameter, combined the information of the Longyangxia-Liujiaxia cascade reservoirs in the upstream of the Yellow River, simulating the 9 kinds of design frequency time-varying design flood process of Longyangxia reservoir. Aiming at the influence on the flood peak and maximum fixed time flood volume of the time-varying design flood process that the mean and occurrence intensity of super quantitative, considering design floods of the 9 kinds of design frequency for Longyangxia, this paper selects the time unit of design flood according to their maximum flood volumes of 15 days, 45 days, and deducing the time-varying design flood process of variable period. According to the joint operation of Long-Liu cascade reservoir on the Yellow River, the corresponding time-varying design flood process of Liujiaxia reservoir is obtained. Applying the time-varying design flood process of variable period length to flood oriented utilization and this paper calculates 20 kinds of operation schemes with different water level, in order to realize the flood utilization of cascade reservoirs on the Yellow River upstream.