

Genetic algorithms based hydropower optimization of the Three Gorges reservoir operation under two reservoir storing water schemes

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Abstract Reservoir-induced alterations in the flow regime of the Yangtze River will unavoidably influence water allocation among different water uses, and as a result, how to optimize reservoir operation to maximize electricity generation is of significance by consideration of different water uses, and this frequently complicates water management decisions. This paper selected the Three Gorges reservoir as a case study site to explore the operation hydropower optimization based on genetic algorithms under two reservoir storing water schemes. On the basis of the 1950–2002 time series of daily discharge data, the satisfying degrees of the optimal ecological flow and the installed plant capacity for five types of year under two reservoir storing water schemes were computed and analysed. The results revealed that the satisfying degrees of the optimal ecological flow and the installed plant capacity varied with the reservoir water storing schemes adopted and inflow conditions.

Key words Yangtze River; Three Gorges reservoir; genetic algorithm; optimal instream ecological