

Assessment of degree of meeting water requirements through water-management balance

P.P. Rutkovsky

Central Research Institute of Integrated Water Resources Management, Slavinsky St., 1, bl.2.
Minsk, 220086, Byelorussia
rutrovskip@mail.ru

Efficient use of reservoirs' water resources is closely related to complete meeting of users' requirements. When using reservoirs' waters, usually a leading economic sector is defines their operational conditions. However, with the course of time there is a change in the use of reservoirs and the reorientation of their initial purposes. Changes in the use of reservoirs affect the hydrological regime of the regulated watercourse and require the development of measures for rational use of reservoirs and the regulated watercourse.

The water management balance, of which the essence is to define the adequacy or lack of available water resources for current or planned needs, is a criterion of the completeness and reliability of meeting water requirements (taking into account the economic and environmental situation). The operational practice shows that water management balance firstly needs to be produced for those reservoirs which have significant human-induced pressures.

In Belarus such reservoirs are the Vileyskoe reservoir and Zaslavskoe reservoir.

The seasonal flow regulation option, which is essential for these reservoirs, allows to use real data of hydrological year to calculate the water management balance.

For the Vileyskoe reservoir such hydrological year is 1984 - 1985, for the Zaslavskoe reservoir - 2004 - 2005.

The water management balance was calculated for selected hydrological years.

Analysis of calculations showed that water resources of the Vileyskoe and Zaslavskoe reservoirs are currently not sufficiently used, especially of the Vileyskoe reservoir, for which there is a substantial reserve of water that isn't used effectively in the current water situation. For the water management balance with a year of 95% probability, the reserve water volume amounted to about 186 million m³.

It should be noted that during operation of the Vileyskoe and Zaslavskoe reservoirs the composition of actors in the water management system was changed to some extent, and new approaches and requirements for protection and use of water resources, including environmentally-oriented ones were developed.

In this context, it is necessary to implement a set of measures aimed to improve efficiency of reservoirs.

Overall, the measures can be divided into organizational and operational-technical.

Organizational measures include prevention and protection measures and are a tool for monitoring and control of operation regimes of reservoirs.

Operational and technical measures that define operation of reservoirs are aimed to improve the use of water resources in reservoirs.