

Improving Large-flow Stratified and Superficial Water Intake System with Mechanical Techniques

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Objectives

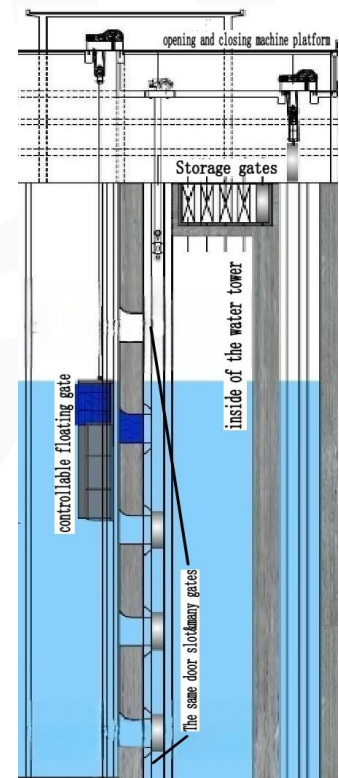
As a relatively static water body, reservoir water is stratified vertically due to sunshine and climate. The water quality of each stratum varies with temperature. The superficial water is beneficial to crops, while the sub-superficial water is suitable for urban water supply. Accurate intake of water required has always been a challenging for water conservancy projects, especially for large-scale projects requiring huge quantities of water. In the past, the plane steel stoplogs and multi-sided towers were usually used for large-flow water intake. However, there are many problems in these two schemes, including cumbersome operation, too large volume of water intake building, poor effect of water intake and unsatisfactory economy. We need a better water intake system to solve the above problems.

Methods

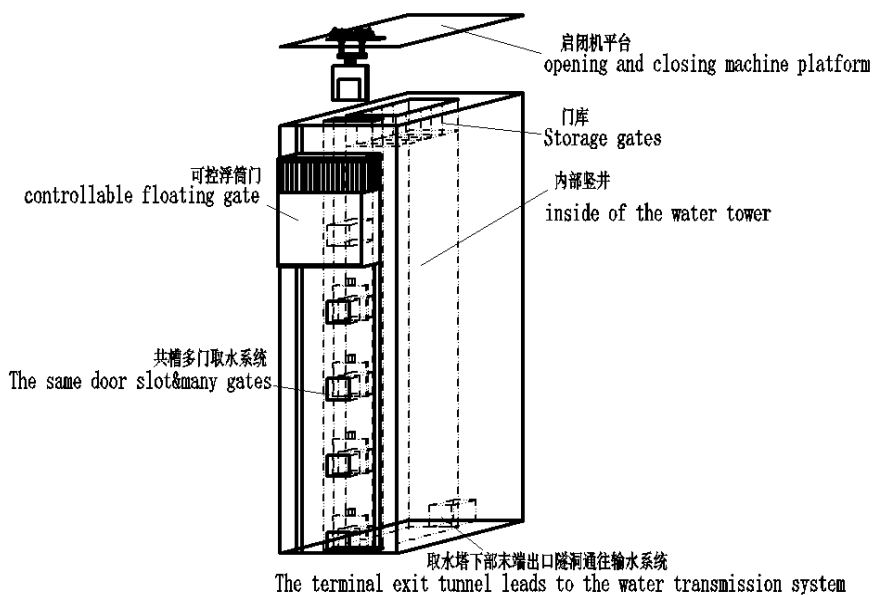
Based on the practice and exploration of several projects in recent years, we have designed a cost-saving scheme which provides solutions to large-flow stratified and superficial water intake and have been applied in projects. In this scheme, several intakes are set up on the same gate groove according to the stratification of water in the reservoir, and a specially designed locking mode is used to make several gates stay at corresponding water intakes accurately to block water, so that stratified water intake is achieved. In order to get surface water, an additional set of controllable large floating gate was arranged in front of the same-groove multi-gate water intake tower. No operation is required for the floating gate, which can auto be adjusted vertically to intake water at any time, so that the required water can be accurately, automatically and continuously taken with the stratified water intake tower.

Results

In this scheme, the problems of cumbersome operation and large engineering quantity of the two schemes are tackled. This design scheme was first used in Dehou Reservoir in Yunnan Province, China. The whole water intake system is simple to operate, stable and reliable after one year's operation. It then has been successfully applied to more several projects.



立体透视图
Stereoscopic perspective



Conclusions

With the help of this scheme, the problem of large-flow stratified and superficial water intake is solved, thereby effectively improving the utilization efficiency of water resources, satisfying the need to intake the corresponding water for agricultural irrigation or domestic use, and reducing the impact of climate change on agricultural irrigation and water supply.