



The Reconstruction Of Changing Power Generation Tube Into Hydraulic Desilting Tube In Shihmen Reservoir

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Abstract

Siltation in reservoirs is inevitable, and its mitigation cannot be conducted by means of engineering alone. Despite the fact that siltation does not affect water supply immediately, water outage caused by the increase of turbidity of the raw water may have urgent and salient impact on the society. The problem of water supply resulted from the impact of Typhoon Avery is mainly related to turbidity. Thus, the focus of the Shimen Reservoir and its Catchments Management Project is on the effective mitigation of the impact that turbidity has on water supply.

According to hydrography, after the high-density mudflow brought by the upstream flood enters the reservoir area, it will submerge to the bottom due to high specific gravity, and then slowly shift downstream. This is the process of *Density Current*. When the current approaches the dam, it can easily be blocked by it, and thus rises from the bottom. If not discharged appropriately, the current will turn the entire reservoir into a muddy lake. After being struck by Typhoon Avery, Shimen Reservoir encountered such situation when the gates of the power generation water intakes were all closed in the middle of the night of August 28th, leaving no exits for the density current. Since the original design of Shimen Reservoir did not include a special sand discharge channel for the bottom holes, the sand can only be discharged through power generation water intakes with limited water flows, and the permanent water inlets, which allow even smaller water flows.

Emptying the reservoir and install sand-discharging facilities is not a feasible way, for Shimen Reservoir is still in operation. Hence, the most direct and effective way to arm the special sand-discharging facilities with bottom-sanding functions is to change Power Generation Tube No.2 into hydraulic desilting facilities, and add branch pipes as well as Butterfly valves to the end of Power Generation Tube No.1 of the original power plant. In this way, both generating sets in the power plant are able to maintain their functions.

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