

VRANOV DAM: RESEARCH OF BOTTOM OUTLETS AND CROWN SPILLWAY

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Waterwork Vranov was completed in 1934, where at that time innovative technology of Johnson-type and cylinder regulating valves was used. During their operation, they did not require major repairs, only routine maintenance and minor repairs was made. However, the current condition of the valves no longer guarantees reliable long-term operation in terms of corrosion and operational damage. Povodí Moravy, s. p., commissioned a study on the reconstruction of regulating valves, the result of which was a proposal to replace four existing valves with four new radial gates. The aim of the research was to verify the functionality of the new designed radial gate valves of the bottom outlets of the Vranov dam and their interaction with the crown spillway and the cascade. As part of the research, two physical models were built – a model of one bottom outlet (scale 1: 14.68) and a model of the dam (scale 1: 55). Within the research on the physical model of the bottom outlet, the main goal was to determine the capacity of the bottom outlet in relation to the water level in the reservoir, the water level of the bottom water and the degree of opening of the radial gate. The model of the dam was used to assess the spatial flow in the stilling basin during the transfer of water through the spillway, or the interaction of stream from the bottom outlets and spillway. Furthermore, the discharge curve of the spillway was verified on the model of the dam body. The measured discharge curve on the physical model was then compared with the discharge curve obtained from the 2D mathematical model. The mathematical model was compiled and calculated in the FLOW-3D.