

Maintenance and operation of the flood control facilities that support the water disaster prevention system

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1. Actual state and problem on deterioration of river structures due to aging

A river has, addition to the dike and bank protection, miscellaneous facilities such as water gates, sluice gates, and sluice ducts that are constructed to secure the function of the dike in a junction such as side streams and water channels, weir, ground sill that are constructed running across the river channel as well as the water evacuation yard that is constructed to evacuate the water inside. These river structures are important to support the water disaster prevention system that protects the human lives and properties in the watershed as flood control facilities. If we take examples of the water gates, sluice gates, sluice ducts, weir, ground sill and drainage pump stations, there exist some ten thousands of such facilities under direct control of the government, of which approximately 40% have presently passed forty years of age since construction and that percentage would reach 60% in ten years and 80% in twenty years¹⁾.

We are concerned that cracks, opening in joints, caving and land subsidence, resulted from deterioration of the material itself such as cement and steel, local scour by flood flow and uneven settlement of ground will occur in the structure. By that reason, we are confronting them through repair based on the survey and check results made by mainly visual check. The same procedure is applied to aged machinery facilities, gates and pumping facilities.

2. Establishment of river structure management research task force

Study on the maintenance and operation of the river structure needs to have the knowledge and experience of researchers in a number of fields as their objective facilities are diversified and constructed on the ground that is a part of the natural levee and likely to suffer from landform change caused by flood flow. Based on that reason, it is required to have continuous organizational collaboration among administrative staff, practicing engineers and researchers. However, to the present, systematic operation has been never implemented on the research task related to the maintenance and operation of the river structures. In particular, satisfactory study is not implemented so far on the technical study concerning the long term prediction on the aging of the river structures and middle and long term management based on that study although it is a significant task of the actual operation.

MLIT Water and Disaster Management Bureau River

Environment Division, NILIM River Department and PWRI Construction Technology Research Department have, under common task recognition and understanding of the situation of overall social capital maintenance, established the river structure management research task force on April 2012 in order to organize researcher group to pursue the structural subject management technology appropriate to the river.

3. Operation to ensure the function of the Water disaster prevention system

A number of flood control facilities suffering from aging are something we have to implement maintenance and operation in a good effect securing the efficiency with a restricted budget. For that purpose, it is imperative to give the priority on the executing check and countermeasure on considering the significance of the water disaster prevention system as well as that of deterioration degree of individual facility. What is anticipated further for the maintenance and operation of the flood control facility is to implement check without error through developed check method for invisible portion such as underground, high places and narrow places.

To meet such tasks, the river structure management research task force is considering studying a method to evaluate the effect given by deteriorated materials on the function of the flood control facility and link it to evaluate the function of the water disaster prevention system supported by the flood control facilities. Further we are to implement survey on the actual state of the visual check and repair works executed in the last five years, and do comparison between disturbances checked visually and actual disturbance verified on the repair works in order to submit proposition of the method to use such investigation and check results more effectively. We are to make the example report on the disturbance and repair so as to make clear the characteristics of remarkable disturbances and portion pursuant to the type and location environment of the flood control facilities. Furthermore, we would promote the technology development to implement check and diagnosis of invisible portion under collaboration of industry, academy and administration.

【Reference】

- 1) YAMAMOTO Hiroshi and OMATA Atsushi: On the "Master plan for long-life and update of river structure", Pump, No.47, pp.8-13.