ANALYZING OF DISCHARGE CORRECTION IN CASE OF FLOOD

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In flood case, discharge observation is used to by rod float getting out of hazard conditions. But the observation method used by rod float is not based on hydraulic theory, just only integration of velocity and cross sectional area. This method is seldom to get correct data, because a few rod floats on complicated flow and rude cross section leveling. That why, it is important to be modified a correction of discharge observation data. The method of correction is hydraulic way by water surface gradient. After the correction, the confirmation(inspection) survey whether modified discharge data are correct or not to be used by the method of 2 dimensional numerical analysis on unsteady flow. This 2 dimensional numerical analysis is given modified discharge data as boundary condition of upstream, and given observed water level as boundary condition of downstream. If resolution of this analysis could be able to calculated almost same water level with anther observation water level.(middle stream gauge), given modified discharge data are correct. In other words, it is inspection to be corresponded with observation data and calculate water level by 2 dimensional numerical analysis to be used modified discharge data for boundary conditions. It was convinced that observation discharge data were needed to modify corrections.

This report has been divided into three parts. In the first part is how to modified hydrometric observation discharge data, In the second part is how to prove modified discharge data are correct. And in the final part is the necessity of correcting observation discharge data.

The experiment was used rod float to have a depth of immersion 75% of the water depth. It Reduction factor of rod floats is k=0.94.

Passages numbers of floats in section are five sections and measuring sections are 100m

According River Bureau in Japan et al [1], next method are appropriate for correction of observation discharges.

By Manning formula $$\frac{Qm}{Qob} = \sqrt{\frac{Im}{Iob}} \quad (1)$$

Qob: Observation discharge, Qm: discharge of stationary state

Iob : water-surface gradient, Im: mean of water-surface gradient

From (1) the next (2) formula can get. Discharges of stationary can be computed.

$$Qm = Qob\sqrt{\frac{Im}{Iob}} \quad (2)$$

Qm is consisted the meaning that be steady flow not to be consider the water-surface gradient. On the other hand, next step it be calculated Qa' using the data of measuring water-surface gradient.

$$Qa' = Qm\sqrt{Iob/\mathrm{Im}} \tag{3}$$

The correct rating curve can get to be relationship between Qa' of formula (3) and water level.

Using a simple eddy viscosity model for turbulence closure, can get predict the velocity distribution at fully developed flow with some success for the case of a wide main channel.

So, modify correction discharge data are inspected by the model. Calculation water level coincided with observation water level of middle stream not to be used to input data as boundary conditions.

The irregularities of bed slope, ground roughness, vegetation lead , vortex current rapidly changing mean velocities from one cross-section to another. It is too difficult to measure velocity in those such complicated flow of flood. That why, necessity of correction are not only water surface gradient to be introduce in this report. There are a couple of other factors involved when measuring of flood current flow by rod float.

It is very important to consider observation discharge data during flood are having irregularity. So useful corrections of observation discharge data are eagerly acquired by fluvial hydraulic research.

REFERENCES

River Bureau Ministry of Land. Instructor and Transport Japan Hydrological text book p.233