

PENGEMBANGAN MODEL HIDROLOGI-HIDRAULIKA UNTUK PENGENDALIAN BANJIR WILAYAH SUNGAI BENGAWAN SOLO HULU

Ridwan Fauzi Rakhman
10/309643/PTK/7191

Telah dipertahankan di depan Dewan Penguji
Pada tanggal 9 April 2012

Pembimbing Utama
Dr. Ir. Rachmad Jayadi, M. Eng.

Pembimbing Pendamping
Dr. Ir. Istiarto, M. Eng.

Anggota Dewan Penguji Lain
Ir. Joko Sujono, M. Eng., Ph. D.

ABSTRACT

Flood control of the upper Bengawan Solo River basin that conducted by the Wonogiri Reservoir authority is related to the decision making process for spillway gates opening operation so that excess outflow does not occur in the downstream area. The decision-making have to be done rapidly and accurately which is supported by an integrated information system such as flood forecasting and reservoir flood routing. Research on the development of hydrologic models to estimate flood inflow hydrograph, reservoir flood routing, and the characteristics of flood hydrograph in downstream area of the reservoir has been done, but still as partial work. Therefore it is required a hydrology-hydraulics model that able to integrate the developed partial models. This model will be used as supporting information systems in decision-making process for spillway gates opening operation. Thus flood control implementation in the upper Bengawan Solo River is expected to be done in an integrated and more effective than ever before.

The decision support software for spillway gates opening operation on the flood period was developed using Visual Basic and MySQL. There are two simulation process on this application. First, flood forecasting simulation is to estimate flood inflow hydrograph based on realtime rainfall information obtained from 14 rain gauge stations in 8 watershed's Wonogiri Reservoir. Second, reservoir flood routing simulation is to obtain the spillway gates opening operation based on reservoir water level and discharge outflow in accordance with the guidelines of reservoir operations during the flood period and flood control criteria have been established.

The results of the study showed the realtime results of hydrology network monitoring can be directly to be used for forecasting flood hydrograph entering Wonogiri Reservoir. Then, based on reservoir water level information and initial spillway gates opening, optimal spillway gates opening operation will be calculated at every considered time of operation. This application is expected to be used by the Wonogiri Reservoir authority as decision support information systems related to the spillway gates opening operation during the flood period.

Keywords: spillway gates opening operation, flood forecasting, flood routing