

## ABSTRACT

Ubolratana Dam, one of the main multi proposed reservoir in the Northeast of Thailand, often encounters an operational problem during flooding season. It cannot release stored flood volume because the discharge of downstream channel is usually at its full capacity. This consequently causes the dam to risk of being spilled by the next flood. Therefore, this study proposes a decision support system for solving the problem. The system approximates an inflow hydrograph by the ratio of cumulative water flow volume of previous day to that of today (RatioV). The ratio is used for characterizing three principal properties (flow volume, peak discharge and time to peak) of the inflow hydrograph to predict the volume and peak discharge of inflow hydrograph. They are applied to determine its return period from design flood hydrograph. The designed flood at that period is then routed through the considered reservoir for determining the reservoir discharge for each day by reservoir routing method.

The proposed system was applied 34 years (1970 – 2004) of inflow hydrograph records for Ubolratana dam. They were selected to test the proposed system for only the years when the spillway was operated (i.e. 1970, 1975, 1976, 1978, 1980, 1988, 1990, 1991, 1995, 2000, 2001, 2002, and 2003). Results indicate that the proposed operation of the dam is better than the existing one. This is because the system give the outflow peak which smaller than the candidate one does. Water at the end of the season is generally at normal high water level (at 182 m-MSL) or 2,263 million cubic meters. The obtained results were then used to construct a relationship between storage and outflow for using as an operational guideline. They were shown their feasibility by testing with a series of actual flood-hydrograph data that were not considered in their development.