THESIS TITLE : RESERVOIR OPERATION PLANNING

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ABSTRACT

The objectives of the study are to obtain a procedure for planning long term operation of existing multi-purpose reservoir when inflow and water demand change in the future and to determine the reservoir operating rule curve.

It was proposed that Stochastic Dynamic Programming is an appropriate procedure for such planning. The Ubolratana reservoir was chosen as a case study. The objective in operating the reservoir is to maximize the benefits from hydropower , irrigation , and water supply for municipal and industrial uses. The reservoir operating policies obtained from Stochastic Dynamic Programming were evaluated using Monte Carlo simulation. Twenty synthetic annual rainfall data , each of 30 years length , were generated using Autoregressive Lag-One Model. From the generated rainfall and future land use scenarios ,reservoir inflows were determined using a regression model proposed

by Boripun (1989). Effects of increasing water demand and inflow were investigated.

Although the objective function is different from that of the present reservoir operation , it was found that Stochastic Dynamic Programming produced reservoir operating rule curves that are appropriate and consistent with the changes in water demand and reservoir inflow. With proper objective function ,that is one that includes flood control benefit and loss from spill ,Stochastic Dynamic Programming should give a good reservoir operating policy for future water demand and inflow conditions.