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AUTOREGRESSIVE INTEGRATED MOVING AVERAGE

JUTAMAS KEERATIBUMRUNGPONG : APPLICATION OF BOX-JENKINS
MODELS TO WATER ALLOCATION : A CASE STUDY OF NAM OON DAM.
THESIS ADVISORS : MONTIP TIENSUWAN, Ph.D., JULIAN POULTER, Ph.D. 153
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Forecasting about water is a necessity for water management administration. In this thesis, the storage, inflow and outflow in Nam Oon dam, Sakonnakorn province of Thailand, which were observed by the Royal Irrigation Department were analyzed with a mathematical model. The Box-Jenkins technique was used for identifying the parameters of an autoregressive integrated moving average (ARIMA) model. The Akaike Information Criterion, the Schwartz's Bayesian criterion and the mean square error were used throughout to test for simplification of any particular model. The periodogram analysis was used to confirm the existence of a seasonal period in the ARIMA model. The findings of this study showed that the seasonal period of the ARIMA model was 12 while the seasonal periods of the periodogram analysis were 6 and 12. In addition, we compared the ARIMA model of outflow data which is divided into three areas; Left Main Canal (LMC), Right Main Canal (RMC) and Nikom Nam Oon residence area with the irrigation operation plan. The forecasts of the ARIMA model had a mean square error smaller than the forecasts of the irrigation operation plan. That is the forecasts of the ARIMA model are more accurate than the forecasts of the irrigation operation plan. Moreover, the Box-Jenkins technique costs less because it uses less variables than the irrigation operation plan. Hence, the ARIMA model can be applied to the irrigation operation plan to forecast better data.