

Dam breach parameters and their influence on flood hydrographs for Mosul dam

ABSTRACT

Dams breach geometry prediction is crucial in dam break studies. The characteristics of flood hydrographs resulting from a dam breach essentially depend on the breach geometry and the required time for breach formation. To investigate the impact of breach parameters on maximum breaching outflows, five breach prediction approaches were implemented to calculate the flood hydrographs using HEC-RAS model, for Mosul dam. Numerous reservoir water levels for each approach were considered. Sensitivity analysis was carried out to evaluate the effect of each parameter on the resulting flood hydrographs. The time and value of peak discharge for each scenario were analysed and discussed. Results show that the most suitable method for estimating breach parameters for Mosul dam was the Froehlich approach. Furthermore, the sensitivity analysis shows that the breach side slope does not affect the peak discharge time and has a minor influence on peak outflow values. Meanwhile, the required time for the breach to develop was highly sensitive to both peak discharge and peak discharge time.

Keyword: Breach; Dam break; Flood hydrograph; HEC-RAS; Mosul dam; Sensitivity analysis