

## عنوان مقاله:

Optimal Economical Design of Labyrinth Spillway using Mathematical Models

## محل انتشار:

هجدهمین کنفرانس هیدرولیک ایران (سال: ۱۳۹۸)

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## خلاصه مقاله:

When we encounter the flood remarkably after implementation and during operation, one of the ways to deal with this problem is to increase spillway capacity besides of increasing height of dam. The economic issues related to the plan are another important point, which must also be considered simultaneously. In this paper height, increase of ۲.۳۵ meters in Zarrinehrud Dam has been studied through the two mentioned methods: the first way is to increase the spillway crest level to ۲.۳۵m by using concrete. The second way is without any changes in the current level of the threshold of labyrinth spillway, the valves are installed with the height of ۲.۳۵ meters. In this way, the normal water level will be increased to ۱۴۱۸.۳۵ meters in the reservoir. The purpose of this study is to reach an optimal economic model that leads to find optimal dimensions of the spillway by considering hydraulic efficiency, in such a way that alongside minimizing the total cost, the best hydraulic design is obtained. The optimal model has been solved by using software LINGO applying the optimal model in designing labyrinth spillway in Zarrinehrud dam shows this fact that the choice of twelve labyrinths with a height of ۲۳۰ m is the economical option. The results of solving the model, by using the restriction for the head, indicate that we are able to travel the designed flood to the reservoir with head ۳.۶۰ m by increasing the total length to ۵۷۴.۷ m. This requires ۴۰% cost increase

## کلمات کلیدی:

Labyrinth Spillway, LINGO, Mathematical Optimization, Magalhaes, Labyrinth weirs

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