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Complications are often encountered when applying empirical laboratory design methodologies for labyrinth spillways to real-world applications. In particular, real-world applications often do not replicate the ideal flow conditions created in laboratory models and must account for irregular conditions such as curved approaches, bridge decks and piers, non-prismatic channels, and unusual tailwater conditions. These irregular conditions can have significant adverse impacts on the performance of the spillway. By applying a combination of published laboratory design data, engineering judgment, and detailed hydraulic computer modeling, economical and reliable labyrinth spillway designs can be achieved.

The purpose of this paper is to share lessons learned and an approach to successfully apply empirical laboratory design information for labyrinth spillways to unusual real-world applications. The recent design of the labyrinth spillway at Lake Scranton Dam will be used as an example to illustrate the process. The authors will also share lessons learned from other labyrinth spillway designs and recommendations for designers considering labyrinth spillways in less than ideal conditions.