

## **Improved reservoir level assessment through the mathematical modelling of weir crest coefficients**

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**SYNOPSIS.** An accurate assessment of reservoir levels is a key part of any dam safety review. Assessing the catchment hydrology will yield incoming floods but their accurate routing to assess associated reservoir levels will also require an accurate assessment of outlet work discharge characteristics. In the case of simple overspill weirs the discharge coefficients are all too often guessed or estimated as constant values, whereas in fact they are more likely to vary with head.

Recent statutory inspections at Loyne and Cluanie dams revealed that weir discharge coefficients of 1.57, 1.63, 1.71 and 2.00 had all been used at different times in the past, by different engineers for essentially the same structures. For the inspection in 2005 the free flow surfaces over both weirs were simulated using computational fluid dynamics (CFD). This enabled the weir discharge coefficients to be assessed for a range of flows. The use of these for subsequent flood routing reduced reservoir levels at both dams.

The paper describes this work and gives recommendations for more simplified, assessments at other dams in the future.