



EVENING MEETING

MONDAY 19 JANUARY 2015 at 5:30pm

One Great George Street, London

(Nearest tube: Westminster)

CFD for Spillway Analysis

By

Jon Walker, Mott MacDonald Bentley
John Chesterton, Mott MacDonald
David Neeve, Arup
Andrew Hobson, Yorkshire Water

For a brief synopsis see overleaf

Admission free

Teas available from 5.00pm

For more information please contact
Tim Fuller (BDS Secretary) on 020 7665 2234 or
email : bds@ice.org.uk

This meeting will also be streamed live on the internet. For more details on how to view this meeting online please visit the BDS website.



CFD For Spillway Analysis

Synopsis

Traditionally, Froude scaled physical models have been used to investigate the behaviour and, in turn, solutions for reservoirs and their spillways under design flood conditions.

An alternative (and/or complementary) approach to modelling spillway structures is to use Computational Fluid Dynamics (CFD). This comprises numerical modelling of systems involving fluid flow and the associated phenomena. This method has been well established in the aerospace, automotive and maritime industries across the world for over 50 years. Improved survey methods using laser scanning, combined with an increase in computing power and visualisation software has meant that CFD is also becoming an increasingly viable tool for investigating the hydraulics associated with spillway modifications.

This presentation discusses the use of CFD modelling undertaken for reservoir overflow spillways in Yorkshire in the last 10 years. Two recent case studies at Stubden Reservoir and Strines Reservoir have used the latest software and technology to develop detailed CFD models. At Stubden, the CFD model was validated with a physical model constructed at 1:20 scale. The study at Strines used CFD to evaluate the forces on individual masonry blocks in a stepped spillway during the design flood. The advantages and limitations of CFD models will be discussed along with suggestion for further research and development.

Biography details for the presenters

Mr Jon Walker

Jon is Design Manager for the Mott MacDonald Bentley (MMB) Reservoirs Team in Leeds. He has worked on design and build reservoir safety projects for over 10 years including numerous spillway modelling and refurbishment schemes for Yorkshire Water.

Mr John Chesterton

John is a civil engineer working with Mott MacDonald in Cambridge. He has worked on dams and hydraulic structures for over 10 years, the last five of them based in the UK. His experience includes numerical and physical model studies and he has a keen interest in improving the evaluation and design of hydraulic structures through modelling.

Mr David Neeve

David is a chartered civil engineer who first worked on dams and reservoirs at British Waterways (now the Canal and River Trust). He now works across all aspects of reservoir

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engineering at Arup and is currently developing the virtual integrated design process. David will supervise an Arup-funded PhD on CFD, which will inform Arup's ongoing research into its application to reservoir spillway design.

Mr Andrew Hobson

Andrew is a civil engineer with Yorkshire Water and is the Senior Project Manager working on the Reservoirs Team in Leeds. He has held a number of operational and asset management posts over the last thirty years and has also been a member of the panel of Supervising Engineers for the last five.