



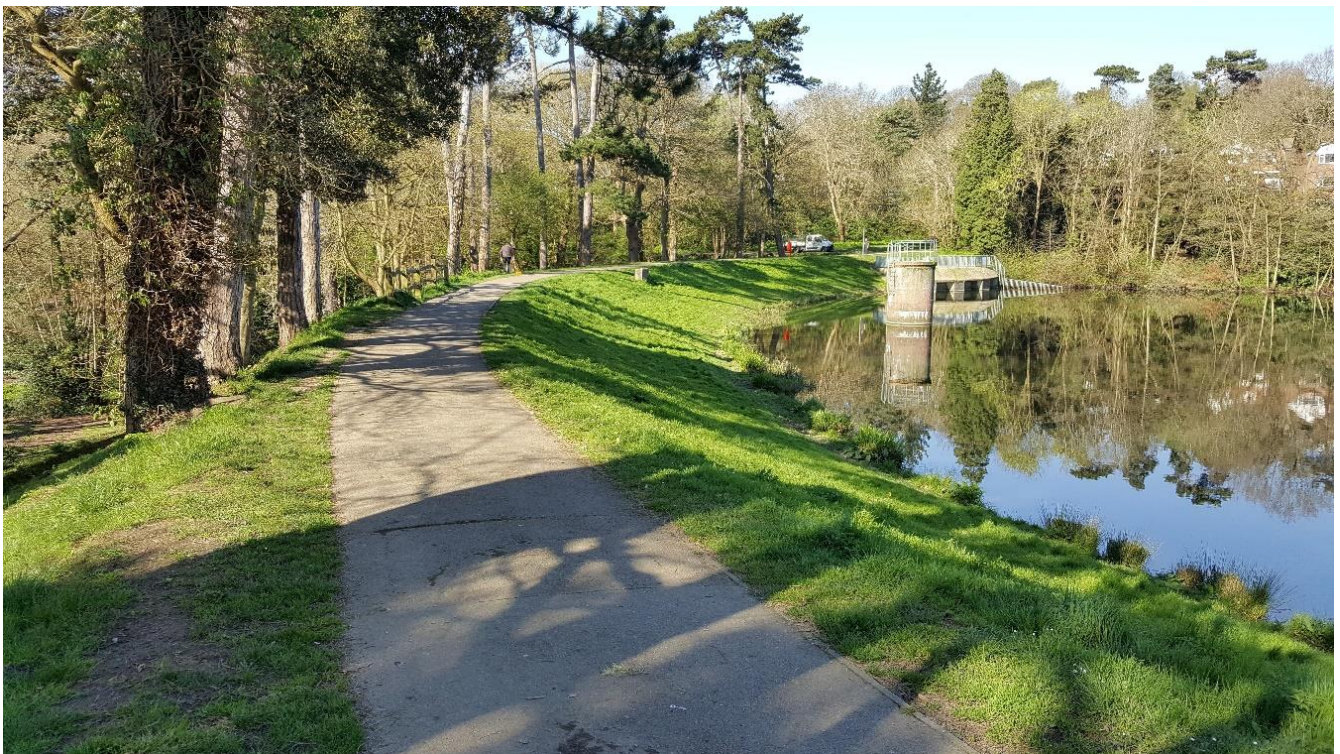
The British Dam Society

EVENING MEETING

Monday 11th January 2021 at 6:00pm

The use of dam break risk curves to optimise an ALARP assessment

Hermann Stehle
Jon Holland
Rhys Coombs
Tom Wanner



For synopsis and brief presenter biographies see overleaf

This meeting will be streamed live on the internet via MS Teams. For more details please visit the events page on the BDS website: <https://britishdams.org/meetings-and-events/events-calendar/>

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Synopsis

An ALARP study has been undertaken to determine proportionate reservoir safety improvement works at the Category A Buckshole Reservoir in Hastings, East Sussex. The study addressed a recommendation as to measures to be taken in the interests of safety following a statutory inspection in June 2016 under Section 10 of the Reservoirs Act 1975. The inspection report concluded that the service spillway would not accommodate the design flood flow and damage to the dam during extreme flood events was likely, possibly leading to a breach failure. The study examined a range of flood events to develop risk curves associated with the estimated likely loss of life and property damage resulting from dam failure. Using the risk curves, it was then possible to determine the flood event that yielded the greatest incremental consequences of dam failure. The relevant flood event in this instance was shown to be an event significantly less severe than the design flood event. This was then used to determine the most appropriate level of reservoir safety works based on ALARP proportionality calculations. The results of the study highlighted that the use of risk curves can provide a more accurate basis for an ALARP assessment of reservoir safety improvement works, giving an improved outcome in terms of reduction in risk and the cost to the reservoir owner.

Presenter Biographies

Hermann Stehle is a Civil Engineer for Stillwater Associates Ltd. and has over 8 years' experience in reservoir and dam engineering in South Africa and the United Kingdom. He spent 5 of those years in the employment of the South African National Department of Water and Sanitation where he was involved in statutory reservoir safety inspections and the design, construction supervision and management of remedial works to state owned reservoirs. In March 2017, one year prior to relocating to the UK, he moved to a civil engineering consultancy where he was involved in the design of two new large concrete gravity reservoirs for hydro-electric, domestic and irrigation supply purposes in South Africa. Hermann successfully registered as a Professional Engineer (Pr. Eng.) with the Engineering Council of South Africa (ECSA) in June 2017. Since moving to the UK in April 2018, Hermann has been working on several projects involving the design and management of reservoir safety remedial and upgrade works to existing dams. Hermann is a member of the Supervising Engineer Panel in accordance with the Reservoirs Act 1975 and the Reservoirs (Scotland) Act 2011.

Jon Holland is a Chartered Civil Engineer with over thirty years' experience in flood risk management and dams and reservoir engineering. Jon has worked on a range of dam projects throughout his career, with an increasing focus on reservoir safety in the past fifteen years. Before becoming a Supervising Engineer, Jon was South East Water's Engineering Manager for Major Resources, responsible for reservoir safety and regulatory compliance. He re-joined Halcrow in 2009 and has since worked primarily on dam projects, including designs for a number of flood storage reservoirs, and flood defence schemes. More recently, working for Stillwater Associates Jon has built a significant and varied portfolio of reservoirs as Supervising Engineer and continues to develop his expertise in promoting and designing reservoir safety improvement works.

Rhys Coombs is a Chartered Engineer with 10 years of experience in dams engineering, reservoir safety and both hydraulic and hydrological modelling. Rhys is one of the co-founders of CC Hydrodynamics, a specialist hydraulics numerical modelling house which relies heavily on HPC (high performance computing) and automation to manage and streamline data heavy activities. Rhys has recently worked on delivering flood studies and detailed portfolio scale dam break assessments for several different UK clients.

Tom Wanner is a Chartered Engineer, and All Reservoirs Panel Engineer, with over 20 years of experience in dam and reservoir engineering. Tom has worked in the dam engineering field in the UK and Australia managing many large water supply, flood storage and tailings dam projects involving design, investigation, risk assessment and construction. Tom has participated and led many dam safety risk assessments from portfolio risk assessment for large UK water companies, to qualitative risk assessments of water supply dams in Australia, to failure modes analysis of irrigation dams in Africa.

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