



EVENING MEETING

MONDAY 19 November 2012 at 6:00pm

One Great George Street, London

(Nearest tube: Westminster)

Implementing the new FEH rainfall depth- duration-frequency model for reservoir flood safety assessment

By

**Lisa Stewart and David Morris
(Centre for Ecology & Hydrology)**

For a brief synopsis see overleaf

Admission free

Teas available from 5.30pm

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.



Implementing the new FEH rainfall depth-duration-frequency model for reservoir flood safety assessment

By

Lisa Stewart & Dave Morris (CEH Wallingford)

Synopsis

The assessment of flood risk is a vital element in the safe design, maintenance and operation of large reservoirs. In the UK, the standard approach is to use statistical estimates of rainfall frequency in combination with an event-based rainfall-runoff model to derive a design inflow hydrograph, which is then routed through the reservoir. The presentation describes the development of a new rainfall depth-duration-frequency (DDF) model for the UK designed to replace the DDF model published as part of the Flood Estimation Handbook (FEH) procedures in 1999. The work to develop the new model was commissioned by Defra following concern expressed within the reservoir profession about the extent to which the FEH rainfall estimates of long return period were found to deviate from those obtained from the earlier design standard published in the Flood Studies Report (FSR) in 1975. In many cases, the FEH rainfall estimates were found to exceed those of the FSR, and even to exceed estimates of probable maximum precipitation.

The presentation introduces the background to the problem and describes the steps taken in the development of the new DDF model. Estimates from the new model are compared with those from the FEH and FSR for a number of example sites from across the UK. Recent work funded by CEH has focused on the generalisation of the new model across the UK and this has led to a number of refinements. These will be discussed and an example application will be used to demonstrate the impact of the new DDF estimates on reservoir flood risk assessment.

Although the impetus to revise the FEH DDF model came originally from users requiring estimates of extreme floods, the new model will replace the existing FEH model for the full range of return periods from 2 to over 10,000 years. Plans for the development of a new software package to provide quick and easy access to the new frequency estimates will be presented, and the pressing need for revised guidance to Panel Engineers will be discussed.



Biography details for presenters

Lisa Stewart, Manager, Flood Estimation R&D Centre for Ecology & Hydrology, Wallingford

Lisa Stewart has over 20 years experience as a hydrological researcher and manager at CEH Wallingford. Her main research interest is statistical hydrology, particularly the spatial and temporal characteristics of extreme rainfall. Lisa was a member of the Flood Estimation Handbook (FEH) core research team, and managed the development of the FEH software tools for the implementation of the recommended methodologies for flood and rainfall frequency estimation. Lisa currently leads a number of projects related to the continuing development of FEH methods, including the hydrology of small catchments, so-called 'next generation' techniques of flood frequency estimation and the implementation of the new FEH rainfall depth-duration-frequency model.

Dave Morris, Senior Hydrologist Centre for Ecology & Hydrology, Wallingford

Dave Morris has over 30 years experience as a hydrological researcher at CEH Wallingford. His main area of work is the development of spatial datasets to enable the UK-wide implementation of new techniques. Dave was responsible for the development of many of the datasets that underpin the FEH. He produced the first digital national flood risk map of the UK. He has used the FEH statistical methods to produce automated estimates of flood flows at 50 metre intervals across the river network of the UK; these have been used by EA, SEPA and the NI Rivers Agency in the production of their publicly available flood risk maps. He is currently working on the implementation of the new FEH rainfall depth-duration-frequency model.