

TOWARDS IMPROVED RESERVOIR SAFETY



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The floods in 2007 and 2008 highlighted the vulnerability of some UK infrastructure, such as electrical distribution centres and water treatment works, to inundation and failure. There were concerns that Climate Change could make such floods more common. The Pitt Review in 2008 suggested such works be given greater security against these events.

The near failure of Ulley dam in 2007, with approx £10 million of consequential costs, highlighted the damage potential that could result from a UK dam and reservoir failure. Consequently the Pitt Review also recommended changes to the UK Reservoirs (1975) Act. The 1975 Act was built on the foundations of the 1930 Reservoirs Acts but was not fully implemented until 1986/87. The 1975 Act relies on reservoir

supervision and periodic inspection by specialist Engineers selected by peer interview and re-assessed and certified every 5 years.

The changes to the Reservoirs Act are enshrined in the Flood and Water Management Act 2010, which was pushed through Parliament in the final days of the last administration. Consultation occurred although many industry participants felt that much had

been pre-decided. One key change included the option of reducing the size of storage to which the Act would apply from the current 25,000 cubic metres. A new threshold of 10,000 cubic metres is suggested, though not yet prescribed. This would more than double the number of reservoirs to which the Act would apply in England in Wales.

To offset this increase in numbers it is suggested that “low risk” (or more accurately low hazard) reservoirs be taken out of an active monitoring regime, although they would remain listed. To assist in this assessment government-funded, “broad brush” Reservoir Inundation Mapping (RIM) has now been completed for over 2,000 UK Reservoirs at a cost of £2 million. Emergency action plans for the 100 highest hazard reservoirs will also be prepared with £1.25 million of Government funding. Owners will be expected to fund action plans for the remainder, which is causing some resentment in the industry, especially amongst fishing clubs and recreational or ornamental lakes where available revenue is limited or non-existent. The proposal that reservoir owners fund future Environment Agency reservoir-related costs has also surprised and alarmed many.



The Pitt Review also recommended future reservoir safety be “risk based” but two problems have emerged. One is mixed legal messages and requirements. The emergency evacuation of a reservoir requires the reliable operation of low level outlet valves. Annual, or ideally three monthly, testing is needed to avoid possible seizure. Inspecting Engineers may stipulate this in their reports with ultimate enforcement of such requirements by the Environment Agency (EA) in its role as Enforcement Authority under the Act. However the EA have also issued a recent protocol, itself a legal requirement, which prevents this being done without costly and extensive risk analysis in terms of effects on downstream flora, fauna and water quality. While laudable there is little doubt that this will put the safety of some of our reservoirs at risk by discouraging routine outlet testing.

The second problem relates to assessing risk of dam failure. While various methods exist, all ultimately rely on judgement. Probable risk cannot be assessed to the level of accuracy often implied and there is much controversy among practitioners about the viability of current methods. However all such methods rely on accurately



assessing reservoir water level during flood and hence likely flood magnitude. The Flood Estimation Handbook (FEH) introduced in 1999 was found to be deeply flawed when applied to estimating the long period rainfalls required for reservoir safety purposes. Recent work by CEH, Wallingford has redressed the matter but the results are not available in an industry usable form. It would seem that the EA only fund “research” and not the implementation tools needed to turn such research into practice.



This policy will also present problems if and when the new Act is implemented and when the many guides to the existing Act and associated practices need to be revised and re-written.

It took 12 years to fully implement the 1975 Act. It is to be hoped that sufficient time will also be taken to implement the new Act to ensure that it is workable.

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