

## **ARD COMMITTEE BRIEFING ON RESERVOIRS BILL**

**THURSDAY 25 MARCH 2014**

**14:30, Room 30**

### **Attendees for ICE:**

Alan Cooper OBE CEng FICE  
Jack Meldrum BEng FICE  
David McKillen CEng MICE  
Stephen Orr CEng MICE

### **STATEMENT ON BEHALF OF ICE**

#### **Welcome**

1. The Institution of Civil Engineers welcomes the opportunity to discuss the Reservoirs Bill with the Committee, and we thank you for the invitation to meet.
2. I am Alan Cooper, and my colleagues are, Jack Meldrum, David McKillen and Stephen Orr. Jack, David and I are all experienced dam Panel engineers and Stephen is in the process of training to become a Panel Engineer. David, Stephen and I represent a committee of the Institution of Civil Engineers in Northern Ireland which has provided a technical advisory role to DARD regarding the guiding principles of the Reservoirs Bill. Jack is an All Reservoirs Panel Engineer and represents the Institution's Reservoir Committee. He will inform you further about its function and mechanisms later in our presentation.
3. Before we commence I would like to make it clear that flooding arising from the uncontrolled release of water in storage is entirely different from flooding from rivers and surface water following heavy rainfall. Failure of reservoir structures produces fast-flowing, deep water which, as history tells us, has claimed lives and damaged livelihoods. The Institution is a professional body with many members engaged in design, operation and maintenance of reservoirs and so we are acutely aware of the need for vigilance in order to protect life and property from undue risk from failure.
4. I, and my colleague Jack, will give a brief statement on behalf of ICE, following which we will be pleased to answer any questions you may have.

#### **Reasons for the Reservoir Bill**

5. ICE supports the introduction of a Reservoirs Bill to establish the legal and administrative frameworks for regulating reservoir safety in order to reduce the risk of flooding as a result of dam failure. It is estimated that approx. 150 impounding reservoirs will come within the scope of the Reservoirs Bill.
6. 'Public' reservoirs in Northern Ireland have been managed by the statutory authorities, notably Northern Ireland Water, and have generally followed the provisions of the Reservoirs Act 1975, which is applicable in England and Wales as best practice, even though this Act does not apply in NI. The

Institution is strongly supportive of the introduction of specific legislation for the safety of reservoirs in NI.

7. However owners of 'private' reservoirs have no obligation to follow the 1975 Act. The introduction of this Reservoirs Bill will ensure public safety assurance to all reservoirs of 10,000m<sup>3</sup> capacity and above. ICE supports the adoption of the 10,000m<sup>3</sup> threshold. Until the reduction, there had been concern for some time, in particular within the profession, that the 25,000 cubic metres threshold was based on outdated understanding of the current risks to reservoir safety. The 25,000m<sup>3</sup> corresponds to reservoirs of at least this size which were responsible for the fatal incidents in the 1920s. There have been a number of incidents at smaller reservoirs in recent years where there was potential for loss of life and the figure of 10,000 cubic metres capacity was therefore concluded to be the right one for assessing risks to the public from reservoir failure.
8. However, ICE is pleased to note that the safety record of reservoirs in NI has been good with no fatalities reported, even though some reservoirs have failed. However, we believe that we cannot be complacent, and since many of the reservoirs are in excess of 100 years old, a well-structured and enforceable Reservoirs Bill will provide assurance for the safety of the public.
9. We support the Bill's assertion that the inspection and supervision regime of all high and medium risk reservoirs requires qualified civil engineers (referred to as Panel Engineers) to carry out inspections and make recommendations. This is the only suitable means of managing the risk of failure. We would however recommend that even low risk reservoirs should have some regular form of inspection, rather than relying on change of downstream conditions being identified by planning processes or the review by the Enforcement Authority.
10. There will be financial implications arising from regulation and these may cause concerns, among owners, many of whom may have limited resources to meet its requirements.
11. Existing impoundments contribute to the environment in terms of habitat, flood attenuation and amenity use to the overall benefit to society at large. Consequently, it is important that the costs associated with regulation do not result in owners modifying their reservoirs to remove their capability of holding water, in order to avoid the financial burden of routine maintenance and inspection.
12. My colleague, Jack Meldrum will now explain the process for Panel appointments and inspections and the general working of current legislation in GB.

### **1975 Act and Panel appointment process**

13. As mentioned by my colleague, Alan Cooper, I am an AR Panel Engineer and I am currently a member of the ICE Reservoirs Committee whom I am representing here. I have been a Panel Engineer since 1987.
14. I will deal with the general workings of the Reservoirs Act 1975 first, then explain the Panel Engineer system and how Engineers are appointed to the Panels.

### **Current Working of the Reservoirs Act 1975**

15. The Reservoirs Act 1975 (the Act), as currently applied to England, Scotland and Wales with changes currently enacted from the Floods and Water Management Act 2010 that were introduced in 2013 provides a registration, supervision and inspection system for large raised reservoirs. Prior to latest changes this covered all reservoirs that are capable of storing more than 25,000 m<sup>3</sup>, referred to as 'large raised reservoirs' above the lowest surround ground level. The Floods and Water Management Act introduced a risk based criteria for the requirement for continuing supervision and inspection of reservoirs and changed the minimum size to 10,000 m<sup>3</sup>/s. The 2013 secondary legislation has brought in the risk based criteria and this is currently being introduced. Prior to the 1975 Act, which came into force in 1986 reservoir safety was managed through the provisions of the Reservoirs (Safety Provisions) Act 1930 Legislation that was brought after the failure at Dolgarrog in North Wales where 16 people died when 2 dams failed.
16. The register of all large raised reservoirs is kept by the Enforcement Authority. They keep details of the reservoirs and copies of all reports and certificates, monitor compliance and keep records of incidents. They also take action where non-compliance occurs, although this is normally managed through reminders.
17. In relation to all new large raised reservoirs the Act requires that that the design and construction must be supervised by a Construction Engineer. This engineer will issue both certificates that permit impounding and also provide a certificate that provides a record of the design and construction. After 3 years, and providing he is satisfied that the reservoir no longer requires his supervision, his responsibility ends. The reservoir then comes under a Supervising Engineer. This is a continuous appointment. The Supervising Engineer would typically visit a reservoir once or twice a year to check that no safety issues are arising, necessary maintenance is being carried out, to identify any further maintenance required and that the reservoir undertaker is keeping the necessary records. The Supervising Engineer will provide an Annual Statement to the undertaker advising him of any issues. This will also be copied to the Enforcement Authority so that they are aware of any safety or compliance issues. If the Supervising Engineer has concerns for the safety of the reservoir he may call for an inspection.
18. Two years after new reservoir has been completed and thereafter at intervals of normally 10 years inspections are required. These inspections consider both the condition of the structures as well as review aspects such as the structure stability, spillway and scour capacity. If any shortcomings are identified the Inspecting Engineer may require measures to be taken in the interest of safety, which the undertaker has to comply with. For recently built reservoirs the likelihood of such measures may be expected to be low, but for older reservoirs requirements are more common .

### **The Panel Engineer System**

19. There are currently four Panels under the 1975 Act: All Reservoirs (AR); Non-Impounding Reservoirs (NIR); Service Reservoirs (SR) and Supervising Engineers (SupE). AR Engineers may carry out any of the duties required from Panel Engineers under the Act, including being the Construction Engineer and Inspecting Engineer that I have previously mentioned, whereas Supervising Engineers are responsible for providing continuity of reservoir safety. The members of the NIR and SR Panels have the same responsibility as the All Reservoir Panel Engineers, but they are restricted in the types of reservoirs they

may deal with as Construction and Inspecting Engineers. The current numbers on each Panel are 39, 2, 4 and 141 respectively, i.e. the principal Panels are the AR and SupE Panels.

20. The AR, NIR and SR Panel members are generally senior members of the civil engineering profession and have significant experience in reservoir engineering. The SupE Panel Engineers generally are engineers who have experience in the reservoir engineering, often in operation and maintenance or in assisting in the design and construction of reservoir works.
21. Ideally Supervising engineers should be based in the same region as the reservoirs they supervise so that they are more readily available to attend call outs and also to minimise cost. Construction and Inspecting Engineers frequently work outside their own region.
22. Construction, Inspecting and Supervising Engineers are selected and engaged by the reservoir undertakers. In GB the names of Panel Engineers together with their addresses and contact details are kept on a data base available on the Environment Agency website on the internet. There are no fixed fees for the various duties of the Panel Engineers.

### **Appointment of Panel Engineers**

23. The Panel Engineers are appointed for periods of 5 years. Towards the end of the 5 year period Panel Engineers may apply for reappointment for a further term of 5 years. For example in my case I was appointed initially to the SupE Panel in 1987 and then applied to the AR Panel in 1992 and I have subsequently reapplied four times and my current appointment expires in 2017.
24. The appointment of Panel Engineers is administered by the Reservoirs Committee of the ICE. The Committee makes recommendations to Defra on appointments (or rejections) and they administer the appointment process on behalf of the UK Government.
25. The Committee is chaired by the President of the ICE, or his nominated representative, and consists of a number of Panel Engineers, who serve 3 year terms and representatives of Defra and the Enforcement Authority. Secretarial and administrative support to the Committee is provided by the ICE. I currently serve on the Committee as a AR Panel Engineer and my appointment is from 2011 to 2014. I previously served on the Committee from 2001 to 2004. The role of the Committee is to review applications for both new appointments and re-appointments and to interview applicant where considered necessary (all new applicants are interviewed, but applicants for re-appointment are only interviewed if there are concerns about the application, for example if there are concerns that the applicant has not been keeping up to date with technical or legislative changes.
26. When applying the applicants are required to provide details of their relevant experience and the training they have undertaken. New applicants are also required to provide a record of the particular training they have carried out and a reference from a Panel Engineer who has knowledge of their experience. To help new applicants to the SupE Panel there is a week long course. The British Dams Society, an associated society of the ICE, also provides information to Panel and prospective Panel engineers through lectures, both in London at the ICE and in other major towns, publications and bi-annual conferences. The 2014 conference is being held in Queen's University in Belfast. The Panel application cost is currently £ 385.

### **Provisions within the Bill**

27. The Bill draws on best practice of reservoir management which was established in the Reservoirs (Safety Provisions) Act 1930 and the Reservoirs Act 1975. It builds upon these to include the risk management of reservoirs. The Bill provides for DARD to categorise reservoirs as 'High', 'Medium' or 'Low' risk, which reflect a proportionate approach to the assessment of reservoirs falling under the terms of the Bill.
28. The Bill also provides the Reservoirs Authority with the mechanism, by regulation, to require owners to produce flood plans for their structure to provide assurance and to set out emergency arrangements in the event of a failure of the structure.
29. The Bill also requires Reservoir Managers to ensure that their Supervising Engineers are available at short notice to check the reservoir and to make recommendations should there be any changes in the characteristics of the reservoir. I, and my colleagues, have experience of being responsible for structures which are not in Northern Ireland and we can provide clarification on the mechanics of this during the time for questions.
30. ICE can provide reassurance to the Committee that despite the current limited number of qualified Panel Engineers in NI, in the event of an urgent request, an Engineer from GB can travel to NI relatively quickly. The committee should be reassured that ICE are encouraging the training of chartered civil engineers in NI to become qualified in terms of the Reservoir Bill and this is actively being advanced.

### **Conclusion**

31. ICE welcomes this Reservoirs Bill and we are pleased to have provided advice to DARD during its preparation.
32. We believe that the Bill is required in NI to ensure the safety of reservoirs in terms of public safety as this will allow effective management of a currently inconsistent approach which results in unacceptable risks to downstream communities. The legislation will provide for a measured and proportionate approach to the assessment and management of reservoirs. Thank you for your attention and we will be glad to answer any questions you may have.