The British Dam Society

The Changing Role of the Supervising Engineer

CW Scott, Independent

SYNOPSIS The Reservoirs Act 1975 introduced the role of the Supervising Engineer to reservoir safety legislation. Documentation from the time of the bringing the 1975 Act into force in 1985/86 indicates that the role was envisaged as a technical support to the Undertaker to fulfil his duties under the Act.

Amendments to the 1975 Act in 2003 and 2010 have given Supervising Engineer's additional powers and placed additional duties upon them, some of which came into effect in England following the Ministerial Direction of Emergency Plans. The Independent Reservoir Safety Review Report written by Professor David Balmforth published in March 2021 and a Defra consultation in August 2023 both suggested significant additional duties and obligations.

The cumulative effect of these actual and proposed changes is to alter the nature of the role of the Supervising Engineer with implications covering a range of areas from qualification and experience requirements for appointment to the commercial attractiveness of the work.

INTRODUCTION

The Supervising Engineer role is a key component of the statutory reservoir safety regime across the United Kingdom. In reading to prepare for this paper it became quickly apparent that there are misunderstandings about the statutory role of the Supervising Engineer.

As an example, the Independent Review of Reservoir Safety Report (Balmforth, 2021) – the Balmforth Report - states on page 92:

> "The Supervising Engineer is required to provide a statement each year to the owner on the safety of the reservoir."

This statement is inaccurate. The Supervising Engineer is required to provide an Annual Statement to the undertaker about:

- actions taken by the Supervising Engineer regarding the matters referred to their attention by the Inspecting Engineer or Construction Engineer (Section 12(2) of the Reservoirs Act 1975), and
- any steps taken to maintain the reservoir in accordance with recommendations made under Section 10(3)(b) (Sections 12(2A) and 12(2B) of the Act).

There is no statutory requirement to provide any further information on an annual basis and certainly no obligation to report on the "safety of the reservoir".

Legislative changes since bringing into force of the Reservoirs Act in the mid 1980s have added to the role. There are proposals to further amend the role. It seems important to have a clear understanding of the original role to be able to assess the implications of any proposed changes or additions to the role.

Finally, it is important to record that this paper focuses on the Supervising Engineer role in England and Wales. The Reservoirs (Scotland) Act 2011 and associated regulations define the role and expectations in Scotland. The Scottish Government is understood to have no current plans to amend the 2011 Act based on the recommendations in the Balmforth Report.

ORIGINAL ROLE IN RESERVOIRS ACT 1975

The Institution of Civil Engineer published a report in 1966 (ICE, 1966) reviewing the operation of the Reservoirs (Safety Provisions) Act 1930 and recommending changes and improvements (ICE, 1966). One of these suggestions was:

> "The Committee further considers that the undertaker should be under a statutory obligation to nominate a chartered civil engineer to be responsible for the oversight of his reservoirs. In the event of any significant change occurring in the behaviour of the reservoir this engineer would be required to inform the Panel Engineer who undertook the last statutory inspection."

This suggestion became the Supervising Engineer role in the Reservoirs Act 1975 which was the response to the ICE report.

The unamended Section 12(1) of the Act stated:

> "At all times when a reservoir is not under the supervision of a construction engineer, a qualified civil engineer (the "supervising engineer") shall be employed to supervise the reservoir and keep the undertakers advised of its behaviour in any respect that might affect safety, and to watch that the provisions of section 6(2) to (4) or section 9(2) above or section 11 are observed and complied with and draw the attention of the Undertakers to any breaches of those provisions"

Thus, as noted in the Guide to the Reservoirs Act (ICE, 2014), the two main responsibilities of the Supervising Engineer under the unamended Act were:

- to advise the undertaker on any aspects of the behaviour of the reservoir that might affect safety, and
- to draw the attention of the undertaker to any breach of certificates issued by the construction engineer and to any breaches concerning the keeping of records.

The wording of both the ICE Report and the Act indicate that the intent of the role is oversight of the behaviour and identification of any changes. The various training courses that have been offered to aspiring Supervising Engineers since 1986 have focused on the identification of change from both physical observation and review of instrumentation results.

The unamended Act gave the Supervising Engineer one power: to call for an early inspection by an Inspecting Engineer (Section 12(3)).

Ignoring matters in the interests of safety identified by an Inspecting Engineer, the implicit division of accountability between an Inspecting Engineer and Supervising Engineer could be, simplistically, stated as:

- the Inspecting Engineer identifies:
    - the "normal" range of behaviour of a reservoir,
    - the maintenance requirements necessary to maintain that "normal" range of behaviour, and
    - required record keeping.
- the Supervising Engineer monitors the reservoir to identify if:
    - behaviour deviates, or appears likely to deviate, outside that "normal" range,
    - maintenance activities are being undertaken, and
    - required records are being kept.

Required reporting is by exception, i.e. the Supervising Engineer identifies and reports non-compliance but is not required to report that the Undertaker is compliant.

ADDITIONS TO ROLE

Water Act 2003

The major change arising from the Water Act 2003 was the Environment Agency becoming the Enforcement Authority in England and Wales rather than local authorities.

The other significant change was the provision of a power to the Secretary of State to direct undertakers to produce flood plans for reservoirs.

Floods and Water Management Act 2010

Schedule 4 of the Floods and Reservoir Management Act included a range of a changes impacting the Supervising Engineer role.

The introduction of the concept of high-risk reservoirs and the reduction in the capacity limit from 25,000 m^3 to 10,000 m^3 changed the population of reservoirs requiring Supervising Engineer appointments (although the capacity change has only been brought into effect in Wales).

Sections 12(2A) and 12(2B) introduced additional annual statement obligations related to matters of maintenance identified by an Inspecting Engineer under an amended Section 10(3)(b).

Section 12(6) provided an additional power to require an undertaker to make and report on visual inspections of the reservoir at specified intervals.

Section 12(2AA) required that the Supervising Engineer for a high-risk reservoir be consulted on the preparation of a flood should one be directed. The Supervising Engineer was also required to certify that the requirements of a direction under section 12A(2)(a) and (b) are satisfied and give direction regarding the testing of the plan.

Section 20(4) required that copies of annual statements under 12(2) and 12(2A) and directions under 12(6) should be sent to the Enforcement Authority within 28 days.

Managing Risks for Dams and Reservoirs
Guidance
Guidance, including the material on www.gov.uk and the Guide to the Reservoirs Act (ICE, 2014) has also added requirements over and above the statutory that extend the expectations on Supervising Engineers.

For example, guidance on www.gov.uk regarding Annual Statement states that a reservoir compliance summary should be included. This document effectively changes the statutory "by exception" reporting of non-compliance to an annual reporting of compliance.

PROPOSED ADDITIONS TO ROLE

Reservoir Safety Management Plans (RSMP)

Recommendation 3 of the Balmforth Report introduces the concept of the Reservoir Safety Management Plan (see Box 1). The Supervising Engineer is identified as having a role both in the approval of the RSMP and in certifying compliance with its contents at the end of the year.

As an aside, sub-note (a) of Recommendation 3 includes inaccuracies about the current Supervising Engineer role. The final sentence requires that "The RSMP should include … certificates to demonstrate that the requirements of Supervising and Inspecting Engineers have been complied with." The Reservoirs Act includes no provisions for certificates regarding compliance with Supervising Engineer requirements – and only for matters in the interests of safety for Inspecting Engineers.

RECOMMENDATION 3. Owners should adopt a systematic and well documented approach to reservoir safety management and this should be approved annually:

(a) **The reservoir owner (undertaker) should prepare and implement a Reservoir Safety Management Plan (RSMP).** The extent of the plan should reflect the classification of the reservoir. The plan should detail all the necessary surveillance, monitoring, operation, maintenance, and periodic inspections required at the reservoir, as set out in section 6 of this report, and include a log of all activities to demonstrate that the plan is being effectively delivered. The RSMP should also include, in an appendix, all available details of construction and alteration of the reservoir, copies of reports of periodic inspections by Supervising and Inspecting Engineers, and certificates to demonstrate that the requirements of Supervising and Inspecting Engineers have been complied with.

(b) The RSMP should be kept as part of the Prescribed Form of Record and the requirements of that Record should be amended to accommodate this and avoid duplication.

(c) **The Supervising Engineer should review and approve the RSMP annually and certify that the owner's actions have been carried out in accordance with the Plan.** Approved and certified RSMPs should be submitted annually by the owner to the Regulator.

(d) **The Owner should ensure that all personnel with responsibility for delivering the RSMP are appropriately competent to do so.** For reservoirs in classes 1 and 2 this should include an appropriate means of certifying their competence.

(e) **The Environment Agency should produce guidance for owners for the production and delivery of RSMPs, including exemplars for the different classes of reservoir.** Implementation of these recommendations should recognise that a number of owners already meet many of the requirements of RSMPs and this should not, therefore, impose an undue burden on them.

Box 1: Recommendation 3 from the Independent Review of Reservoir Safety Report (Balmforth, 2021)

Recommendation 4 of the Balmforth Report is wholly related to the Supervising Engineer role. (see Box 2).

Sub-section (a) requires the inclusion of instrumentation records with the Supervising Engineers Annual Statement (referred to as the Supervising Engineer's report). The

Supervising Engineer is required to provide a commentary "explaining how they demonstrate that the reservoir's behaviour is remaining within safe limits." This implies a significant change in the expectation placed on the Supervising Engineer.

As noted earlier, the original intent and the training provided to Supervising Engineers focused

> **RECOMMENDATION 4. Supervising Engineers should be fully engaged in assuring the day-to-day surveillance, operation and maintenance of the reservoirs that they supervise:**
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> (a) **As part of their routine visits to a reservoir, Supervising Engineers should fully engage with surveillance and operational staff, review the records demonstrating tasks completed and verify that the RSMP is being delivered as planned. These are in addition to their existing duties.** Where instrumentation records are being taken, the Supervising Engineer's reports should include a copy of the results, ideally in graphical form, together with a commentary explaining how they demonstrate that the reservoir's behaviour is remaining within safe limits. They should discuss any recommendations with the reservoir owner and where necessary give directions for improvement.
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> (b) **Each year the Supervising Engineer should formally certify compliance with the RSMP as part of the annual statement and approve the RSMP for the following year.** The Environment Agency should be able to review the annual statements of Supervising Engineers and RSMPs and to challenge them (see recommendation 11).

Box 2: Recommendation 4 from the Independent Review of Reservoir Safety Report (Balmforth, 2021)

on identifying change in behaviour and referring to an Inspecting Engineer if the change was of concern. This recommendation appears to step beyond that to the Supervising Engineer being required to express an opinion on how the results demonstrate that behaviour is "within safe limits" rather than whether the results diverge from historic patterns.

Item (c) of Recommendation 3 in the Balmforth Report indicates that the Supervising Engineer should review and approve the RSMP. In addition, under Recommendation 4(b) the Supervising Engineer is to certify compliance with the RSMP. This latter requirement seems to change the Supervising Engineers role from being a support to the undertaker in managing the reservoir to a quasi-audit role as to whether they have complied with the plan. This is a step beyond the original requirement of notifying the undertaker if requirements specified by a construction engineer are being breached.

Records

A consultation was issued by the Environment Agency in August 2023 seeking opinion on a proposal to place a duty on the Supervising Engineer to review and/or update the technical information for the reservoir. The stated intent was that the responsibility for recording the history of the reservoir should lie principally with the Undertaker but with the support of the Supervising Engineer.

Concern was expressed in the responses to the consultation that the introduction of a duty to update on the Supervising Engineer diluted accountability for records. For example, given that duty where would the accountability lie if a piece of information was not in the records? It is no longer 100% clear.

Managing Risks for Dams and Reservoirs
IMPLICATIONS OF CHANGES

Nature of the role

The Reservoirs Act 1975 introduced the Supervising Engineer role. The original purpose of the role was, in the words of the ICE Report, to be "responsible for the oversight" of reservoirs. The Reservoirs Act further defined this as a twofold duty:

- advising on behaviour that may affect safety, and
- advising on any breaches of obligations placed on an Undertaker by either a Construction or Inspecting Engineer.

Originally the latter duty was only to advise the Undertaker, but subsequent amendments included an obligation to advise the Enforcement Authority.

The expectations of the role surrounded monitoring behaviour to identify any changes and involving an Inspecting Engineer of those changes were a source of concern. To date, changes to the role have predominantly provided additional tools to the Supervising Engineer to fulfil those fundamental duties.

The proposed changes in the Balmforth Report appear to change the role to a more active involvement in defining what constitutes "safe behaviour" and necessary maintenance, which has up to this point been in the purview of the Inspecting Engineer, potentially disrupting the clarity of the accountabilities within the framework.

The potential requirements to both certifying a RSMP and that the plan has been implemented introduces a quasi-audit function.

Competence and experience required

Writing in 1986, as the provisions of the Reservoirs Act 1975 were being brought into force, Michael Kennard gave this view on the qualifications and experience required to be a Supervising Engineer and the changing perceptions up to that point:

> "The author's idea of the required qualifications for anyone to be eligible for appointed a supervising engineer would comprise a degree in civil engineering, MICE, employed (or self-employed in a responsible civil engineering capacity and who can show some knowledge and interest in dams and reservoirs." (Kennard, 1984)

Over the years expectations have a become clearer and better defined. Current practice is that applicants must demonstrate in both a written submission and at interview how they meet expectations across a range of attributes. The level of knowledge and particular skills identified relate to the role of the Supervising Engineer, i.e. the monitoring and surveillance of behaviour and identification of changes in condition that "might affect safety". Skills such as defining monitoring and surveillance regimes or diagnosing the condition of a dam are not included. To be clear, there are Supervising Engineers who have those skills, but they are not currently a requirement for appointment.

If the requirements and expectations of the Supervising Engineer role change as suggested by the Balmforth report then the attributes required for appointment will need to be reviewed and adjusted to accommodate the changing role.

Commercial implications

Many major engineering consultancies do not see providing Supervising Engineer services to be attractive business. The risk-reward balance is perceived to be poor with low fees (less than

£1000 per year is common) tied with high potential liabilities (for example, many public bodies required PI insurance in of excess to £1 million for providers of these services).

Litigation usually targets those who are perceived to be able to pay and, thus, a consultancy with PI cover who certified compliance is likely to be a more attractive litigation target then an undertaker with limited resources.

Changes in the requirements of the Supervising Engineer role that adversely impact the risk-reward balance will make the business less attractive. That may not necessarily impact major organisations who have other work but could impact the smaller private owners who are already unattractive clients for major engineering consultancies.

Moves to require certification of compliance with RSMPs by Supervising Engineers or the imposition of a duty to update reservoir records would almost inevitably increase the commercial risk associated with the work. Similarly, a requirement to state that behaviour was within safe limits would increase risk exposure.

The Balmforth Report identified the issue that small owners can have challenges in procuring panel engineer services. Changes that make providing the services less commercially attractive will be unlikely to relieve that issue.

CONCLUSIONS

The purpose of this paper is not to suggest that the proposed changes are incorrect. Rather, that changes should be based on a sound understanding of the various roles within the statutory framework and the interrelation between those roles.

The reservoir safety regime is based on the interaction of several roles (e.g. Construction Engineer, Inspecting Engineer, Qualified Civil Engineer, Supervising Engineer, and Enforcement Authority), with clear, delineated responsibilities and accountabilities. Blurring or adjusting those responsibilities and accountabilities needs to be done with a full understanding of the implications of such changes.

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