

The Future for Panel Engineers

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SYNOPSIS. This paper describes how with the passage of time the role of Panel Engineers had changed and tries to predict the future – and how it might affect Panel Engineers. The paper describes proposals for change and describes the changes which might affect his/her role and activities.

INTRODUCTION

At the time this paper was being written it is unsure whether we will have a completely new Reservoirs Act, an ‘amended’ Reservoirs Act 1975¹, or no change at all to our reservoir safety ‘regime’. However, it is clear that changes are required and that sooner or later they will occur. These changes will change the way in which Panel Engineers will operate and their role.

HISTORICAL BACKGROUND

Panel Engineers were ‘created’ as a result of the Reservoirs (Safety Provisions) Act, 1930² when five Panels were constituted; Panels I, II, III, IV and B. Panels I to IV were what could be loosely described as the design construction and inspection panels and Panel B was an inspection only Panel.

As we know under the Reservoirs Act 1975 the system was simplified slightly to four panels; The All Reservoirs Panel (AR), The Non-Impounding Reservoir Panel (NIR), the Service Reservoir Panel (SR) and the Supervising ‘Engineer Panel (SE). The description of the role of the Panel Engineers is given in Table 1 below.

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Table 1

Panel	Scope of Panel	Replaces 1930 Act Panel
All Reservoirs (AR)	Civil engineers qualified to design and supervise the construction and alteration of, to inspect and report upon, and to act as supervising engineers for all reservoirs to which the Act applies and to act as referees under Section 19 and for the purposes of Section 16 of the Act.	I
Non- impounding Reservoir (NIR)	Civil engineers qualified to design and supervise the construction and alteration of, to inspect and report upon and to act for the purposes of Section 16 on all reservoirs to which the Act applies which are not impounding reservoirs and to act as supervising engineers for all reservoirs to which the Act supplies.	II
Service Reservoir (SR)	Civil engineers qualified to design and to supervise the construction and alteration of, to inspect and report upon and to act for the purposes of Section 16 on all reservoirs to which the Act applies which are not impounding reservoirs and which are constructed of brickwork, masonry, concrete or reinforced concrete and to act as supervising engineers for all reservoirs to which the Act applies.	IV
Supervising Engineer	Civil engineers qualified to act as supervising engineers for all reservoirs to which the Act applies.	No equivalent

Clearly one of the most important, if not the most important, feature of the Reservoirs Act 1975 was the creation of the role of the Supervising Engineer; an engineer employed to visit the reservoir at least once a year, to

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look for changes in behaviour and/or appearance, and who would call for a statutory inspection if he felt it necessary.

In the 1980s suggestions were made to make the system more complex with a move towards a ‘driving licence’ type of Panel Membership where you would be empanelled only for those reservoirs for which you could prove experience. Details of this proposal are given below:-

Table 2

		Categories					
		Embankment	Concrete and	Service			
		Any Height	Masonry	Reservoirs			
Height < 5m							
Designation							
Panel	Title	E1	E2	C	SR		
1	Construction Engineer	*		*			
2	Inspecting Engineer	*	*	*	*		
3	Supervising Engineer	*	*	*	*		

It was proposed that tailings lagoons, if brought within the scope of the Reservoirs Act at some future date, would be treated as a separate category like Service Reservoirs, with construction and inspection duties being combined.

APPOINTMENT TO THE PANELS

Appointment to the Panels is by the Secretary of State who delegates the assessment of persons who wish to become Panel Engineers to the President of the Institution of Civil Engineers and his/her Reservoirs Committee.

The composition of the Reservoirs Committee and the means by which persons can apply to become a member of a Panel and the information they should supply is given in a number of publications³.

Over recent years the assessment process has become a little more auditable, more organised and perhaps a little bit more demanding to ensure the quality of membership of the Panels moving into the future. Experience, attendance at inspections, confined space training and continuing professional development (CPD) continue to be the main requirements for appointment and re-appointment.

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THE PANEL STRUCTURE OF THE FUTURE

A recent study was undertaken for the ICE and Defra into the Panel System and whether it should change.

By assessing the number of certificates issued under Section 10(5) of the Act the study showed that most of the work carried out by the Panel Engineers was carried out by those on the All Reservoirs Panel, viz:

Table 3

Panel	No. of Certificates	% of Total	No. of Dams
AR	1272	96.5	
NIR	17	1.3	478
SR	28	2.2	154
TOTAL	1317	100.0	632

The study undertook to consider the following questions:-

- Is the Panel structure correct? i.e. the correct number of Panels; are they effective and appropriate, do we need more/less/different?
- Are the numbers of Panel Engineers falling? – Is this a concern? – If so is it an immediate or long term problem? – And what should we do about it?

The current situation with regard to the number of Panel Engineers is shown below:

Table 4

Panel	Number of Engineers	Estimated Average Age
AR	42	55
NIR	5	55
SR	6	55
SE	160	52

Looking at the average age of the Panel Members perhaps it is not surprising that the average age is in the 50s because to become a Panel Engineer on one of the ‘design and construction and inspection panels’ (AR, NIR, SR) you do have to have a considerable amount of experience. However, perhaps more worrying is the average age of our Panel of Supervising Engineers. In my opinion this should be considerably lower, perhaps in the range 32-37; does this high average mean we are not encouraging young engineers or not training enough young engineers to

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become Supervising Engineers? I believe it does and to avoid problems in the future the larger consultancy firms must invest for the future and start bringing the young engineers into dam engineering.

Table 5. Reports Issued by Individual Engineers in the four year period 2004 to mid 2009

	>300	>100	50-100	25-50	15-25	10-15	<10
AR	1	1	4	7	8	8	18
NIR	-	-	-	-	-	-	4
SR					1	1	

It is clear that much of the work carried out on non-impounding reservoirs and service reservoirs is done by All Reservoir Panel Engineers and even then there are 7 or 8 engineers on the All Reservoirs Panel who do the majority of the work, certainly in England and Wales.

The report presented to the ICE Committee identified the following points derived from the statistics and came to some conclusions which might affect the Panel System in the future.

- Most work is done by the AR Panel Members even for non-impounding and service reservoirs
- There are sufficient AR Panel Engineers to meet demand at the moment
- There are 7 or 8 Panel AR Engineers who do most of the work
- The age profile of AR Panel Members is such that there isn't a problem at the moment i.e. there are 6 engineers in the lower end of the age range – but this needs to be borne in mind perhaps in the next 10 years. The AR Panel should be preserved
- The SE panel faces a more immediate problem – not only in terms of its age profile but also in terms of numbers. This is an immediate problem that needs attention but the SE Panel needs to be preserved
- It is also quite clear that owners and undertakers in general choose very carefully who they ask to do their work.

Further recommendations of the report included:

- The NIR Panel can be run down and there is no need to maintain that Panel
- There is an argument to keep the SR Panel but its membership numbers and the level of activity will always be low

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- There is no need for an ‘Inspecting Engineers’ Panel – one who can only carry out inspections – such a panel could result in more costs to owners and be a dangerous move.
- The training of All Reservoir Panel Engineers needs to include the softer issues of social skills, effective communication, pragmatism and also the technical skills of dealing with emergencies.

Thus as we move into the second decade of the 21st century some 80 years after the formation of the Panel system we may see more change including perhaps

- A rationalisation of the Panel System
- A more robust empanelling system
- An initiative to recruit younger engineers into the roles – particularly that of the Supervising Engineer and
- Increased training needs in social skills and emergency management

REPORTING

In the past the quality of reports has been rather variable. When the Reservoir (Safety Provisions) Act, 1930 came in to being many of the reports were very comprehensive but by the 1950s some of the reports were at most half a page or even a few lines in length.

Another problem frequently experienced is associated with recommendations in the interests of safety. These recommendations are recommended in a report and ‘notified’ to the client and enforcement authority via the report and Certificate under Section 10(5). They must then receive a Certificate under Section 10(6) to show that they have been completed; and so they must be items that can be completed, and enforced.

In this respect they must be ‘finite’, but recently there have been recommendations that say that there must be no development downstream and that instruments must be read at monthly intervals, which clearly cannot be recommendations in the interests of safety.

Within the Guide to the Reservoirs Act, 1975⁴ there is an appendix which gives a suggested format for Section 10 Reports and Section 12 Statements which I put together in the early 1990’s. If this format is followed then all reports should be at least ‘adequate’.

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There is a proposal within the amendments to the Act which would allow selected reports to be sent to a sub-committee of the ICE's Reservoirs Committee for review.

Whilst Panel Engineers may perhaps nationally object to such a proposal it is a proposal which only seeks to improve the quality of reports being produced. It will only affect a very small number of reports and perhaps just the threat of a report being reviewed will improve the quality of the reports!

A statistical analysis carried out by the Environment Agency has found that a number of engineers had not submitted reports more than one year after the inspection, and in some cases more than three years! Defra, the Reservoirs Committee and the Enforcement Authority have all indicated that they find this situation quite unsatisfactory both for the engineer and for the owner.

The Environment Agency now advises as part of the reapplication process whether there are any reports which have not been finalised and which are more than one year old, and in those circumstances it is likely that the engineer would be interviewed to explain why the reports are outstanding. From the engineer's point of view he limits his liability if the report is completed, and of course the owner/undertaker receives the necessary direction via the report. Clearly if there are recommendations on the interests of safety these need to be identified to the owner and then he needs to carry out the works as 'soon as practicable'.

The proposed amendments to the Reservoirs Act, 1975 currently going through Parliament can have an effect on Panel Engineers: some clauses are detailed below:

- More work may be involved for Panel Engineers (including the Supervising Engineers) as a result of proposed Clause (2B)
- The undertaker must register a large raised reservoir with the relevant authority. This will apply to all reservoirs in the 10,000 m³ – 25,000m³ volume. It will be a fineable offence for an undertaker not to register a reservoir.
- It is likely that Panel Engineers will also be involved once the Enforcement Authority has deigned to designate a reservoir as a 'high risk reservoir' (2A(1)) – either to confirm this for an owner or to challenge it under 2E.

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- It is likely, as a result of the Reservoir Inundation Mapping (RIM) exercise, that there will be many more ‘high risk’ structures than the current Category A dams.
- Under 12(5) if the Inspecting Engineer has not provided a report within 6 months of the date of the inspection he has to notify the Environment Agency and provide a written statement of the reasons.
- Maintenance issues will become enforceable under 12(6) and will have to be certified.
- Panel Engineers will have to specify a period to complete a recommendation within this report.
- Panel Engineers will have to state whether all safety measures recommended in the previous report have been undertaken.
- The Supervising Engineer must provide a written statement at least once every 12 months 17(3)(2B)
- The undertaker must prepare a flood plan in consultation with the appointed engineer 12AA(2)
- The appointed engineer must certify the flood plan 12AA(3)
- The flood plan will be tested at such times and in such a manner as may be directed by the appointed engineer 12AA(4)
- The undertaker must revise the flood plan in accordance with the directions of the appointed engineer 12AA(7)
- In the case of a high risk reservoir the appointed engineer is the Supervising Engineer! 12AA(9)
- The Minister may make provisions for the assessment of the quality of reports and written statements made by the inspecting engineer and supervising engineers 20A(1)
- The Ministry may require a specified person to make a report to the Environment Agency about any incident 21B(1).

INCIDENT REPORTING

Incident reporting is an important system which seeks to enable us to learn from incidents and accidents. The Enforcement Authority feels that owners have not always reported incidents and accidents and therefore seeks to make the incident reporting system mandatory. The system allows the owner to report the incidents or accidents or to get an engineer to report for them and, if required, anonymity can be guaranteed. With four or more incidents/accidents a year then clearly if the services of a Panel Engineer are required this will add to their workload.

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CONCLUSIONS

As we move to the future Panel Engineers face a situation of more regulation, additional tasks, and a situation where unless action is taken to encourage and train the young then numbers of Panel Engineers will continue to reduce. An interesting and challenging time ahead!

The comments and views given in this paper are those of the author and not necessarily those of Atkins or Defra.

REFERENCES

- ¹ HMSO (1975), *Reservoirs (Safety Provisions) Act, 1975*, HMSO, London
- ² HMSO (1930), *Reservoirs (Safety Provisions) Act, 1930*, HMSO, London
- ³ Hinks (2003), How to get on to a panel and sty there – a personal view, in *Dams & Reservoirs*, vol 13, no 3, pp3-4
- ⁴ ICE (2000), *A Guide to the Reservoirs Act 1975*, Thomas Telford, London