

DOVETALES

15th Edition – Spring 2014

NEWSLETTER of the
NAUNTON DOVECOTE
CONSERVATION SOCIETY and
NAUNTON VILLAGE TRUST



TURBINE EDITION



First, apologies, in that the last edition of ‘Dovetales’ was published in Spring 2010 and we are very sorry not to have come to print since then. This is not because nothing has happened, but more that until recently nothing had been concluded as to our current project, i.e. the proposed re-instatement of our turbine in the sluice building at the Dovecote as a working generator of water power, producing electricity for the National Grid.

You may recall that the generator shed (above) was built next to an existing sluice-gate, to house a Francis-type turbine in approximately 1925. It was installed to supply electricity to The Manor House, the Black Horse and a few other houses in the village. It fell into disuse during the 1950s after mains electricity became available in the village. Wiring connected the generator to The Manor House, via a steel pole on the northwest corner of the Dovecote. The stone building which housed the turbine had fallen into disrepair, but there was nothing to suppose that the turbine mechanism was not still inside the building and capable of being re-instated as a working model and in 2010 the NVT and NDCS decided to try and find out whether it was still ‘in situ’ and capable of being re-instated as a working model.

This edition of ‘Dovetales’ is primarily to update you on the progress of this project and a further edition will shortly follow with more news about Dovecote activities since the last issue, and what is planned for the future.



fig 1

Turbine 'in situ'

fig 2

Turbine viewed
from west
through 'dug-out'
leat entry



fig 3

Turbine after
removal from
building - before
shot-blasting

Turbine Project Objectives:

You will recall that it was our intention to try to remove the turbine mechanism in the sluice building by the river, examine its condition and ascertain whether it could be restored and re-instated in its original position, repair the (now very dilapidated) building (*fig 5*) and then put back into working order in order to generate electricity.

The objectives were (a) industrial archaeology, i.e. to re-instate a water-powered generator to working order which comprised part of a heritage site, for historic purposes: (b) as an educational tool to be available to local schools to visit the turbine as an example of a simple hydro-electric scheme and (c) to provide a further source of on-going income for the Naunton Village Trust/with a possibility of an inexpensive power source for the village hall.

It was hoped that the educational, historic, heritage and eco-friendly aspects of the scheme would make it an attractive prospect for various grant sources.

Feasibility Study:

The first job for Rob Johnson, who had kindly agreed to head this project on behalf of the NVT and NDCS, was to dig out the 'leat' above the building to see if the turbine was still in place. This he did with the help of Josh Harrison in May 2010. (see *figs 1 and 2*). Having established that the mechanism was indeed still there, he commissioned a Feasibility Study from a local firm specialising in hydropower turbines and in March 2011, they reported that they considered that there was sufficient head of water to generate a reasonable income (approximately £4,700 p.a.) from the scheme. In order to maximise this sum they recommended some alterations to the river bed to increase the 'drop' in the water level and thus increase the flow rate/power generated.

If the project could be set up to supply a local public building, such as the nearby Village Hall/proposed Shop, further financial benefits would accrue.

Removal of Turbine:

The next job was to remove the mechanism to examine its state. This proved to be easier said than done, but eventually it was achieved, with some difficulty, by Douglas Hanks, (*fig 3*) thanks to Chris Avery of Cold Aston kindly lending us a suitable machine to lift it. Douglas then arranged to transport the turbine to Stroud to be shot blasted and painted so that its condition could be examined. (*fig 4*)

As you can see from the photographs, considering that it had been immersed in river water since approximately 1925, and had not been used or maintained since the 1950s, there was very little amiss with it. The wooden parts would need replacing, but the metal seemed in reasonably good condition.

Some doubts were expressed at this time as to whether this turbine might have been custom-made to run at maximum efficiency at the particular river flow in the Windrush at the time of its manufacture. There was some concern that a difference in flow between then and the flow now might mean that the machinery would not operate well. However, it was going to be difficult to establish whether or not this was the case.



fig 4 – Two sections of turbine mechanism
now separated, shot blasted and sprayed for preservation purposes



fig 5 – Turbine shed, sluice gate and exit channel
for leat – current condition

Environmental Agency

The next step was to approach the EA to obtain permission to make the alterations which would be needed to the river, i.e. to open up the leat again to allow the water to run through the sluice building/turbine machinery before rejoining the river below the sluice.

A very long ‘pre-application’ application was completed with the assistance of Lawrence Houlden, a recently arrived resident to the village, who happily for us is a professional in this field, and without whose help we would have had to incur quite onerous professional fees to complete the forms.

The EA duly arranged to meet some of us on 5 April 2013 and, considering the minor nature of the project, we were rather surprised to be met by four representatives, each with their own special area of expertise.

It appears that many matters relating to rivers and their management are controlled by our friends in Brussels, who, amongst other things, we were informed would insist on a ‘fish pass’ when any sort of alteration was made to the flow of river water.

Other requirements of the EA included:

An Abstraction Licence

An Impoundment Licence (Cost up to £1,170)

Transfer Licence £135

Flood Defence Consent

Flood Risk Assessment

Planning Consent

In addition, EA insisted that measurements of flow data to assess the amount of water passing down the river would have to be taken over many months, before the various permissions could be granted. Some means of taking these measurements would be needed.

A Fish Screen to prevent fish entering the turbine mechanism

An Eel Passage

Also, the scheme might be subject to a ‘Hands off Flow’ constraint meaning that the EA could switch off our generation if they felt that the river flow was too low - this would require us to provide some means of continuously monitoring the level of the river.

However, the most onerous of all the conditions was the insistence on a fish pass, despite the fact that it is unlikely that fish have been able to migrate up the existing sluice during the time of its existence – photographic evidence of this goes back more than 100 years. A fish pass would either entail asking our riparian neighbour to allow a series of pools to be built on the neighbouring bank, or building such a system round the side of the sluice building on the Dovecote bank, or purchasing a ‘bespoke Lariner pass’ (a design which would be incorporated in a newly designed sluice) which would cost in the region of £25,000.

EA Involvement – Fall out

The restrictions and conditions imposed by the EA on this scheme altered the whole concept in that, even if we were able to re-instate the turbine in working condition, it would bear no visual resemblance to the original set-up. Major building works would be necessary to put the EA requirements into effect, which would alter the appearance of the site and thoroughly disturb the wildlife there.

The increased level of set-up costs meant that the prospective income from the scheme became much more relevant in order to justify the sort of expenditure that it appeared would be required to reinstate the turbine and building. Lawrence Houlden, having examined the EA requirements in detail, also cast doubt on the likely income stream based on the various restrictions they imposed. He considered that £2,700 p.a. would be a nearer estimate of the expected income.

It was still difficult to estimate accurately the budget for the scheme without expending a further relatively large sum in professional fees and applications for licences etc. Due to the technical nature of the project, it was difficult for the Trustees to make a judgement as to whether it was going to be feasible without incurring further considerable costs. Applications for licences would demand properly drawn up plans with detailed measurements – these in themselves would prove expensive, with no guarantee at that stage that the project would be feasible.

Both professional firms which we had consulted had pointed out that unfortunately, the requirements of the EA very often made small-scale schemes such as ours uneconomical to put into effect.

However, the Trustees felt that before they spent any more money, they needed some comfort from someone who had seen these schemes in operation that our turbine would actually work properly in its present situation. It was decided to ask a representative of a Cornish engineering company discovered by Rob Johnson, who specialise in installing these sorts of small hydroelectric schemes, to come and visit our site and advise us as to whether he thought our turbine would work efficiently on the river as it flows now.

In September 2013, whilst we were in the throes of trying to arrange this visit, the Trustees (after consulting with members of the flood committee) agreed to Steve Parkes (owner of the lovely Cotswold sheep who grace the village) lifting one side of the sluice gate to allow more water to flow down the river. The purpose of this exercise was to try and reduce long-term flooding in the Millhays, as had been experienced last winter and which had caused damage to the pasture. However, it was also agreed that, should it be necessary to try and hold the water back to prevent flooding further downstream, this action would be reversed.

In the event, the decision proved even more successful than anticipated in that, despite very heavy rains, neither did the water meadow, nor properties downstream, experience flooding. As you all know, the subsequent rain was as bad as any of us could remember and properties at the east end of the village lived in fearful anticipation of a repetition of the flooding of 2007, or indeed of the sewage back-up experienced last winter.

Eventually, under the intense and protracted rainfall, the river did overflow above the sluice and the Millhays filled with water. This co-incided exactly with the sewage system beginning to ‘back up’ at the east end of the village as in previous years and raised the question again that water might still be entering the system somehow in the Millhays.

At this point in time, the Trustees recognised that they had a responsibility not to undertake any permanent changes to the sluice-gate at the Dovecote which might result in the river overflowing upstream. Unfortunately, the most basic requirement of a working turbine is that as big a 'head' of water as possible is created up-stream of the workings and thus, the re-instatement of the turbine as a working model would immediately give rise to circumstances which might cause problems to other residents. We could no longer consider that a wet winter such as 2012/13 was a 'one off' event, as all forecasters and experts on the subject predict that such winters may become much more frequent.

By opening the sluice in September, we had established that even such a small alteration to its operation could have a beneficial effect to river flow and indeed, we believe that this is the manner in which the river was controlled in the past.

The Way Forward

This realisation, together with the difficulties experienced with the Environmental Agency and the doubts set out above, were discussed in detail at a Trust meeting in January 2014, where it was decided, with some degree of regret, to give up the idea of re-instating the turbine as a working model. Our over-riding reason, as stated above, is that it is not felt to be right to proceed with something that might be seen to contribute towards the difficulties of other people. However, the likely costs and the difficulties of progressing the scheme without the sort of engineering knowledge required, were also considerable factors in the decision.

We are now investigating in more detail proposals, as follows:

1. to re-instate the sluice building which badly needs repair and to incorporate a 'bat haven' in the roof, as suggested by Gloucestershire Wildlife Management Trust.
2. to dig out the 'leat' above the building back to where it joins the river to show how the turbine would have worked, but without joining into the river – thus avoiding EA involvement in the project.
3. to clean off the turbine itself again and re-coat with the best possible protection against the weather.
4. to place the turbine either within the building or in a separate housing to exhibit it for educational purposes.
5. to create an educational display within the sluice building so that the project can be visited for educational purposes as originally envisaged, with the additional advantage of the visitors actually being able to see the turbine mechanism (which if it was functional, they could not have done).
6. to repair the existing sluice to provide a mechanism to allow the gates to be raised and lowered easily so that the water flow can be controlled on advice of Flood Committee for the benefit of the village.

The Trustees have met with their architect and have asked him to help us to prepare plans for submission for listed building consent and any other consents which may be required and to advise on costings for the project.

We appreciate that there will be considerable disappointment from the engineering buffs amongst you as there was always a cluster of enthusiastic support for this project from them – however, their only consolation is that visitors will actually be able to see the turbine mechanism whereas, were it in operation, it would be hidden from view.

The Trustees would like to thank the following people for their help in trying to bring the matter to fruition: Rob Johnson, Douglas Hanks, Handling Techniques of Stroud, Chris Avery of Cold Aston, Lawrence Houlden, Graham Hunter, Peter King and Edmund Stockwell.

This edition of ‘Dovetales’ has been issued solely to keep you informed of matters relating to the turbine project, and we hope to give you a further update in the next edition. A full further edition of ‘Dovetales’ will follow in the very near future telling you about other matters relating to the Trust and the Dovecote Site. If you are interested in supporting the Trust by becoming a ‘Friend’, details of how to do this will be included in that edition or you can contact Penny Hanks at Spring Barn, Naunton, GL54 3AS.



fig 6

**The sluice gate and turbine shed showing exit channel for leat:
photograph taken circa 1930 when the turbine was newly installed**
(supplied by kind permission of David Hanks of Cotswold Images)

Current Trustees and Trust Officers:

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David Pickup, Stuart Corbyn*

*Secretary to the Trustees: Diana Woolley
Treasurer to the Trust: Gerard Hanks*