Combe Mill

Saga of the Standby boiler

Written by Richard Brown

The Cornish Boiler, built in 1852 of wrought iron, failed the annual examination on 25 November 2004. The examiner asked for a drill test at a point where the boiler rests on the foundation brickwork as he had seen a thick layer of rust. On drilling, the drill bit and went straight through. There was no sign of metal so it means that the weight of the boiler resting on the rust was all that was holding the pressure. Needless to say, he stated that the boiler was unsuitable for further service until major repairs were carried out.

Cornish boiler front

In the meantime, we had to look at repairing the Cornish boiler and/or obtaining an alternative source of steam. We put the word out that a boiler was needed.

A member phoned to say that he had heard of two Lancashire boilers that had to be disposed of at fairly short notice. They were located in Blackburn. One was a Ruston Hornsby built in 1962, 13ft long x 7ft dia, welded construction and coal fired, weighing about 4 tons with a current certificate.

View of the drilled hole from flue showing minimal thickness of iron November 2004

Consideration was given to this boiler but it was agreed that it was rather too big for our purpose as we would have to move it and the decision to have it would need to be made virtually overnight. Reluctantly, we had to refuse it.

In early March 2005 Alan McEwan visited Combe to assess the boiler and give us a quote for a repair. His price for repair was far more than we could afford unless we could get funding. Additional costs would be the removal of the boiler from the building, transport to Keighley, return and rebuilding the flues around the boiler. He also offered us a Spencer Hopwood vertical boiler from a LMS Cowan Sheldon steam crane. This had been reconditioned and was priced at £4,000 + vat. Much as we would have liked this boiler, there was no way we could afford it without additional funding.

Alan McEwen and Son visiting to estimate for repair March 2005

In order to keep going we needed an income so we had to open to the public in March, hopefully with steam to run the beam engine. Fortunately, John Wharton came to the rescue and said that he would send his 1887 Marshall traction engine to supply steam for the March open day. We gratefully accepted his offer and Mark and Carl brought it to Combe and supplied steam for the March 2005 open day. The traction engine had to be sited at the rear of the mill in the lean-to so a steam main had to be installed. This was 1½" dia with a pressure reducing valve located above the Cornish boiler and feeding into the existing 4" cast iron main. A 1½" steam hose connected the traction engine to the new main.

John Wharton's 1887 Marshall traction engine at Combe March 2005

In April 2005, a call was received from a member of COSME, who was looking for a package boiler for a steam launch, saying that he had been offered a Stone Vapor flash boiler which was located at Liverpool University. Arrangements were made to visit the University to view the boiler and, if suitable for our purpose, to make arrangements for its transfer to Combe.

New steam main from traction engine to beam engine

It appeared ideal (no pun intended!) so a provisional agreement was made. The committee agreed to obtaining this boiler until a problem arose. A member, who formerly worked for Babcock-Wilcox, spoke to a colleague who knew this boiler. He said it was 6,000 Ibs/hr whereas we need a maximum of 1.500 Ibs/hr and we need to make sure that the coils had been properly drained and were filled with a dewatering oil otherwise a new coil would be required at a cost of £4,000. On checking, we discovered that the coils had been left full of water for about six years so we had to refuse this boiler.

Stone Vapor flash steam boiler at Liverpool University May 2005

For the open day in May 2005, John Wharton had left the Marshall at Combe so we were able to run as in March using the remainder of the coal from Smarts.

News of available boilers dried up over the summer and John Wharton's Marshall was going to Dorset so would not be available for our August open day. Fortunately, Darren and Joe Curryer offered to bring their Marshall steam roller over to provide steam for the August 2005 open day.

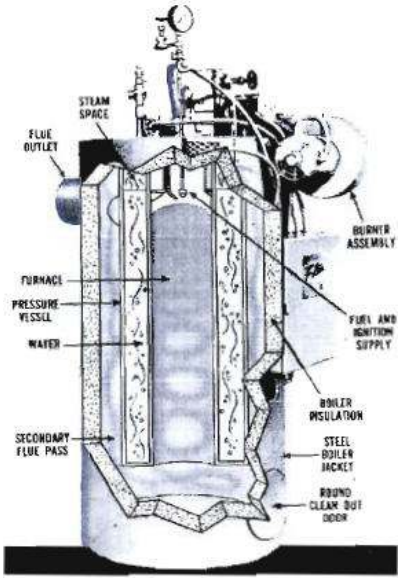
Darren Curryer's 1927 Marshall steam roller providing steam August 2005

Darren and Jack ran the engine but we had problems with the beam engine as the tapping on the roller boiler was on the back-head rather than at the top of the boiler. So we were getting very wet steam which caused problems with the pressure reducing valve.
For the October 2005 open day, John Wharton again provided steam from his Marshall traction engine.
In January 2006, a member contacted Bombardier, a company which repairs and maintains main line railway locomotives. He asked them if they had any train heating boilers available from scrapped locomotives. These are automatic oil fired Stone Vapor flash steam boilers. Nothing came from the correspondence.
A member had been searching for a suitable boiler for all this time and had been offered some unsuitable ones and others at prices we could not afford. In February 2006 one offered was for free and located in Yeovil. It would have served our purpose but was 9ft dia x 20ft long and weighed a staggering 32 tons. We decided that it was a little to large so refused it.

Also in February 2006, Mark who ran the Marshall traction engine at Combe, said that there was a package boiler for sale at a mushroom farm at Black Bourton. Needless to say we went straight over to look at it. It appeared to be just what we wanted. We made a further visit to take the covers off to view both the black and white sides and it looked in first class condition. It was a B&E boiler, built in 1979, 8ft wide and 12ft long, oil fired producing 5,000 Ibs/hr at 100psi and weighing about 4 tons. We asked the Property Director of the Blenheim Estate about locating it and he considered it too big. We then asked the Planning officer at WODC about locating it and he said it was definitely too big to fit in with the Grade II* listed building. So again, we had to refuse even though only £2,000 was being asked for it.

The B&E boiler at the mushroom farm
Note the Coke can be on the burner indicating size

February 2006 was a busy month as we had been in contact with two boilermakers with a view for further quotes in order to apply for funding. One visited and one worked from drawings and information supplied. In the end, neither wished to quote although one did offer to build a replica in steel for £70,000!
The open day in March 2006 was upon us and we still had not obtained a boiler and we needed steam to open. Darren Curryer came to our rescue and again offered to bring his roller. So another open day was achieved. Searches for a boiler resulted in an offer from King Boilers of a Fulton 50E vertical boiler, oil fired, 4.5ft dia x 9ft high, 1,7501bs/hr at £6,400 + vat. Again, we do not have that sort of money although it would have served our purpose well and fitted in the space available.
On 9 May 2006, I was at Whartons where a group work on steam engines and one of those there asked if we had yet found a boiler as there was one advertised on e-bay. He fired up the net and showed me this boiler which looked suitable, so I took the information and phoned the person the next day giving him the details of the boiler we needed. He e-mailed information and a photograph of a Wellman-Robey Sygnette



The Fulton boiler offered by Kings

package boiler built in 1999, gas fired, 150psi, producing 1,600 Ibs/hr. This was located in the ex Sony factory in Bridgend where they made television tubes. (Everyone now buys flat screens) It was closed in February 2006. As the May open day was upon us we were unable to do anything until after that. The open day in May 2006 was again successful as Darren and Joe Curryer had left the Marshall Roller at Combe for the May open day.

On the Monday after the open day I phoned the contact about the Sony boiler. He said that he required a decision by the Wednesday so we made arrangements for two of us to visit the site the following day. The boiler was a Wellman Robey Sygnette producing 1600lbs of steam per hour and working at 10 bar. It was only four feet wide and seven feet long. We were impressed and the boiler was completely suitable apart from the fact that it was gas-fired but were assured that it could be converted to propane or oil. We then went to Ross-on-Wye to see the contact and make arrangements for its removal and transport. So on 4 June, four of us went to Bridgend to disconnect the boiler and move it out from the structure under which it stood ready to lift it. On 5 June, we hired a 7.5 tonne lorry and drove to Bridgend. The boiler was loaded onto the lorry with a Teleporter and drove back to Combe. The chaps from Barlows kindly used their side loader to unload the boiler from the lorry and we pulled it into the lean-to on the skate we had hired.

Wellman Robey Sygnette boiler located in the Sony factory at Bridgend

75% of the recovery team

The boiler has been opened up and it looks good. We were given a full manual and all the relevant certificates and the original quotes and invoices. So we now have the full history of the boiler.
The bottom inspection plate, man lid and front and back plates were removed and the flues cleaned ready for the boiler examiner. On 24 June the boiler was given an external examination and pronounced satisfactory.

Boiler loaded and ready to roll

Contact was made with Weishaupt, the manufacturer of the burner to find out if it could be converted to burn propane. This was confirmed by just changing a spring in the governor but would cost a days service fee to commission it. We were given the gas flow required to fire the boiler so we now had to find a supplier. Calor were contacted and they first of all suggested a bank of 12 cylinders to give sufficient flow of gas. On top of this we would need the collection manifold. We await developments. Calor were not very hopeful that we would be able to obtain sufficient flow from cylinders and promised to give us a definite quote. We await their answer.

Sygnette boiler located m the lean-to at Combe

As it was suggested that we may not be able to run on propane due to technical matters and the cost,

it was decided to investigate the possibility of converting to oil. Weishaupt have been asked for requirements and cost but we still await their reply.


Steam main with PRV near new boiler

In the meantime the steam main has been altered to bring the pressure reducing valve (PRV) close to the boiler with a steam trap on both sides as recommended by Spirax Sarco. It is essential that the pressure reducing valve is supplied with dry steam. A new safety valve has been fitted to give a pressure of 30psi whereas the one supplied earlier was only 18psi. The control panel has been investigated and control charts compiled together with circuit diagrams. The spirals were replaced and the front and back plates replaced. The boiler was levelled and positioned in the most suitable place.

The TDS (total dissolved solids) has been removed and a blanking plate made and fitted. The old ducting from the saw mill extraction system was taken down and will make a good temporary flue for the boiler. The inspection covers still need to be replaced and the flue connected.

Water treatment is being investigated. The boiler inspector suggested that a tannin treatment is used. A store of water is needed and it is recommended that a quantity sufficient for an hours running is stored. Removal of oxygen in the feed water is important and this can be done by raising the feed water to 80°C. Therefore, we need to obtain a tank large enough and suitable to store 160 gallons of water at 80°C. It has been suggested that a scrap chemicals container would be adequate.

The Estate has been contacted and asked to arrange for a 400 volt three phase supply to be located near the boiler. In the meantime a supply was found by an electrically qualified member and connected to the boiler. At present it is across the floor but needs to be threaded through the roof trusses. This has now been completed with a contactor on the side of the boiler.

In the meantime an application for a grant towards the cost of the boiler was made to WODC. This has proved successful and we have been offered a 50% grant.

Any expert help would be gratefully accepted as this boiler has to be operational by the middle of August.

It now looks as if the boiler will not be operable for August as on 2 August I received an e-mail from the burner manufacturers that they would not convert our burner to oil and suggest that we obtain a burner designed for oil. As we have not received any more information from Calor, it would appear that they are not prepared to offer any more advice.

The bottom inspection cover has now been replaced and a water tank has been obtained. We now need to build a structure to raise the tank about 1 metre above the pump inlet and pipe it to the

pump. We will then be able to fill the boiler and hydraulic test it.

Continuing.

Richard Brown 3 August 2006

Saga of a Boiler 2

After receiving the e-mail from the manufacturer of the burner that it would impracticable to convert the burner to gas, a phone call was made to them. A person in the sales department said that a new one could be supplied but he would need to visit to take dimensions and details. This he did the following day and we await the result