

Progress 2013

Strategic Intentions:

So where are we going in 2013? With the bogie completed and wheels ready for final painting, effort will be focussed on completing the main axleboxes. The measurement jigs are in production and the axle centres measurement rods complete. Delivery of the jigs is expected by the end of 2012, which will then allow the overhaul dimensions to be specified for the axleboxes at the South Devon Railway, plus grinding of the hornguides by Nichol & Andrew, an on-site machining company. With these tasks complete, it is hoped to be able to create a rolling chassis in time for 27 July when a 'County Day' will be held to present 1014 to the public.

With the completion of the dragboxes by Boro' Foundry and they will be moved, with the ladder frame, in February, to Multi-Tech in Pontefract. There the tender main frames and buffing plates are being worked on currently, consequently it is expected the bare tender underframe will be completed by mid-year. Once this underframe can be moved back to DRC, and get space in the Works, the horns, axleboxes, wheels, brake gear, buffing plates and internal buffers will be fitted. Then the aim is to set up the tender superstructure workstream, now a year late, subject to the availability of space in the Works.

Meanwhile work will continue on the cab floor and, subject to funding headroom, initiate machining of the forged outside motion blanks, currently stored at Ufone. Delivery of four new eccentric straps, and possibly their rods, is expected in 2013. Furthermore, the quest to acquire or manufacture the balance of Lot 350 type inner motion con it nu es, besides acquisition of a 3-row superheater; the latter will probably be new work using a resin pattern. It is also hoped to complete both vacuum brake cylinders, the tender brake crossbeam, its support frame and brackets, as well as specifying the double blast pipe, now the boiler centre line dimensions have been confirmed.

The boiler, now located at LNWR Heritage Crewe, is currently being reworked to No. 15 OA specification, and work will continue, subject to a satisfactory funding profile, with an anticipated delivery in 2014 for fitting in 2015.

January

Active work at DRC was hindered somewhat by inclement weather, notably the unloading of a load of steel and other recently delivered components and its manual removal to the County Project working area, which had to be postponed until the first weekend in February. Meanwhile a host of planning activities continued apace to ensure that the schedule of work remains more or less on course.

The month also saw the welcome return to active duty on the Project of Terry Pattinson and LaDonna.

Work began on repairs to a necessary item of 'infrastructure', namely the 'Gibbon', also known as YAM 2. This will be required to move the larger items around the DRC Works area, which it is anticipated will emerge this year, notably the tender underframe.

The wheel sets have been removed and the superstructure stripped. The wood is rotten and many of the bolts/ties are bent but 90% are recoverable.



05/01/2013 - The 'Gibbon' or YAM 2 prior to stripping.



05/01/2013 - Following removal of the wheels the YAM is stripped to its basic wooden (oak) frame.

Locomotive Progress

There have been conversations with Robert Stephenson of Stephenson Engineering in Manchester. It appears that Stephenson's forge has been used for many years to producing components for mining equipment and also railway parts. Robert realises it is an asset to industries such as ours and has done work for the preserved railway. Small quantity is not a problem (although there is an issue of scale on steel purchase) but a conrod would defeat them on size. Forging valve extension rods, extension bars and brake parts have been discussed, as well as the smokebox saddle, the latter being a plain fabrication albeit with a thick curved top where it joins the smokebox. MATSPECS are no problem and Robert recognised the use of EN 8 and 16 in railway use.

A bid pack together of CADs, the original drawings and component images will be put together for him to give a price quotation.

Work has now started on the wheel measurement process for machining the main frame horn guides/axleboxes. Measurements taken to date indicate the back-to-back and axle diameters are within design tolerance. Delivery of the horn guide jigs within 14 days has been promised.

Mike Cooper is in contact with Applied Inspection, an NDT test house based in Burton-on-Trent, who is likely to be engaged to crack test the frames before the wheels are fitted. He does NOT want to land up in a Flying Scotsman situation.

The cab work stream continues to progress and cab parts in bilious green are breeding!! Work is going well on the rear angles, which support the front and rear sections of the roof panels, with both angles cut and tacked. Welding was planned for 12 January. Joe Sherwood has almost completed the access cover on the reverser tower. Steel for roof sections and main brace was expected by 19 January, but delivery to the Works was delayed by the weather.



Acquisition of a steam generator to provide a battery charging capability for the on-board power for the TPWS/OTMR/speedometer system. It still looks expensive, particularly as our contact has discovered that the electrics do not work. This may act as an advantage as we would be able to purchase the non-electrical components and do a modern fit of a 24 V charging system.

05/01/2013 - Steam generator in 'as received' condition

Tender Progress

Drawings for the tender brake cross shaft and accessories have now been completed and pattern/casting costs for the brake cross shaft, support bracket and bearing carriers/caps obtained. It is intended that the cross shaft be machined by one of our local contractors and the cranks manufactured separately and welded to the shaft, as per the prototype.

Replacement bearings for the brake hanger brackets are almost completed.

Regarding the water scoop gear, both lever shafts have been stripped and the forked base of the scoop standard shaft has been recovered for reuse.

Machining of the horn guides is complete.

February and March

Progress was slow during the winter months, partly because of the weather, Mike Cooper's infirmity and non arrival of the components for the axlebox jigs.

On the plus side LaDonna returned and immediately set about painting the driving wheels and tidying the Pooley van.

Locomotive Progress:

Although some components for the jigs are still awaited some parts have arrived and are being worked on.

Mike Cooper has declared that rewheeling of the locomotive by 27 July cannot be achieved, as components are still awaited for the jigs, thus measurements cannot be made and there is too much associated work to be done in the time remaining. Every attempt will be made to get the locomotive moving using the bogie and a Gibbon.



29/03/2013 - Part of the jig fitted in the axlebox.



29/03/2013 - Jig drilling.



29/03/2013 - Drilling the distance tube.



29/03/2013 - Joe marking up jig components.

After discussion with Applied Inspection, an NDT test house based in Burton-on-Trent, the scope of the NDT tests on the loco frame have been agreed. The frame has been marked up and paint is being removed to facilitate ND testing.

A response is still awaited from Ufone on the price review for machining the lead coupling rods. However, Mike Cooper is presently considering moving to another contractor who has completed the connecting rods' machining for the Patriot project at a very competitive price. Following further discussions with Stephenson Engineering in Manchester on forging the remainder of the inner motion, i.e. three eccentric rods. Costings have now been received for forging these parts in BS 970 150M19, which is a very similar specification to the original GW Spec 19, AutoCADs have been completed and it is hoped the works order will be issued shortly. A second valve rod cross head has been acquired.

Work has started machining the front and rear sleeves and the PB internals.

The majority of the metal for the cylinder drain cock gear has been delivered as part of a major in load on 2 February.



02/02/2013 - A collection of recently delivered parts, including cylinder drain cock gear.

Having been undercoated, the driving wheels have been black gloss painted.

Painting of the eccentric sheaves and axles in frame red to follow.



16/02/2013 - Progress on driving wheels - undercoat complete.



29/03/2013 - A wheel painter at work

Work has stated to fit the four mudplates around the exhaust pipes.

At LNWR Crewe, firebox work has started on the removal of the side beams of the foundation ring. To this end, in three days, the NRM found Dwg No 119745 for a No 15 Boiler Foundation Ring, which was passed to Richard Watkin.

The cab is still moving well. All roof sections have arrived and the rear sections have been welded and shaped, with the guttering angles completed. All the roof angles have been cut to shape and are being welded. The support strap is being adjusted to fit between the cabside reinforcements.

The access cover on the reverser tower has been completed by Joe Sherwood.



16/02/2013 - cab sides fixed in position and painted.



16/02/2013 - Rear cab roof section. being prepared for fitting.

Both nameplates have had their mounting brackets fitted and are ready to be bolted to the splashers.

Work on the bogie including painting, lock nutting and pinning of the pintle is complete.

Tender Progress:

Following an acceptance meeting on 14 March attended by KWG and the Chairman, a pass certificate for the drag boxes was received. As a result the drag boxes and ladder frame will be moved to Pontefract in the near future - Axle Haulage are being consulted about the movement.



16/02/2013 - moving the ladder frame from the steel base plate, initially to enable shaping of cab roof, but also in readiness for despatch to Pontefract.

An order for the tender cross shaft accessories patterns was placed with Eddie Mcroft on 13 March. Numerous brake linkage bolts have been delivered. Work on the cross shaft continues to be on hold until there is an underframe on which to place it.

The brake hanger brackets have been blast cleaned and primed and await collection. Being of different pattern a drawing is being produced of the rear bracket in AutoCAD.

With regard to the Gibbon/YAM 2, work is well advanced on the frame with all timber cut to length. Terry P is investigating a simpler mortise joint and the steel sheet for the replacement reinforcement plates.

April

Work continues steadily and is ramping up again with the arrival of the hornguide jigs and the warmer weather.

A new machinist has been introduced to the team – Shawn Howlett from Aylesbury, who was recruited by Chris Chalet from the Signals Department. This is good news as the project will now be able to machine parts in-house rather than out-house, which is expensive.

Locomotive Progress:

All parts of the hornguide jigs have now arrived and the centre (and critical) jig is being fitted.

With the arrival of the jigs, and their installation, Doug and his team have now started measuring the horn guide wear with slip gauges in order to specify the axlebox repairs. They can then go to the South Devon for complete refurbishment, with the regrinding of the mainframe horns being done by a contractor.



20/04/2013 - Assembly of the jig components.



20/04/2013 - Assembly of jig continues.



20/04/2013 - Jig assembled and ready for use.

Now that the frame has been stripped of many layers of paint, the NTD tester will be called in to crack test the frames and stretchers.

Contact with Stephenson Engineering Ltd for the production of the 3 eccentric rods has been maintained. The order documentation is ready, thus a formal order will be made in the near future.

Meanwhile, there has still been no response from Ufone on the price review for machining the lead coupling rods.



Fitting the 4 mudplates around the exhaust pipes in the exhaust box is now complete.

20/04/2013 - location of mudplate to be fitted.



20/04/2013 - checking dimensions of mudplate prior to fixing in place.

20/4/2013 - mudplate fitted and bolted into position.

Having completed painting the driving wheels, the team are now concentrating on painting the eccentric sheaves and axles in frame red.

Work continues on machining the front and rear valve spindle sleeves and the PB internals.

Work on the boiler at Crewe has reached the stage when fire box throat plate was ND tested on 12 April as an insurance requirement. Their report has not yet been received.

Meanwhile more bits linked with the boiler are being produced, including a blow down valve.



27/04/2013 - recently arrived and machined blow down valve components.



20/04/2013 - adjusting main roof support strap.

The cab is still moving well. The angle for the rear roof rain strips is fitted and the two parts of the rear roof are joined. The main roof is now welded together and awaits riveting of the front and rear support angles. The main roof support strap is being adjusted to fit between the cabside reinforcements.

Work continues on the main roof section, cab handrails and closure plate detail at footplate level. Once everything fits and is square, the whole assembly will be tack welded as necessary, dismantled, cleaned, undercoated, riveted and re-assembled. For riveting, one (or more!) working weekends is planned - when the weather gets warmer!



20/04/2013 - external view of front, right hand cab side bolted together before checking for its being square.



20/04/2013 - interior view of right hand side of cab - reversing screw and sanding control lever shown.

Labour availability permitting, cleaning the slidebars will commence and the eccentric links will be examined to decide what repairs will be needed to the die blocks.

Tender Progress:

Courtesy of Axle Haulage the tender frame and drag boxes have been transported (from Didcot RC and Boro Foundry respectively) to Multi-Tech in Pontefract for assembly.



20/04/2013 - A boot full of cleaned and primed brake hanger brackets and a draw hook.

The brake hanger brackets have been blast cleaned and primed. They were collected in late April.

The vacuum cylinder piston is being machined in house by Ron Hows and is well advanced.



20/04/2013 - vacuum cylinder piston being machined.



27/04/2013 - vacuum cylinder piston - rear view.



27/04/2013 - vacuum cylinder piston front view - machining complete.

Gibbon/YAM 2:

Work is moving well with the majority of the joints being cut. When all the mortices/tenons and slots are complete, the timber will be moved to the works for assembly.

May

Work progresses steadily. The project is pleased to welcome George Hallett. George was a fireman at 81E in the early 1960s. Barry P is back in harness after his trip to Australia.

Dicky Boast has agreed to stand in as Deputy Project Manager when required and is also taking on the role of project safety coordinator.

Mike Cooper is almost back in full running order after surgery.

Strategy Paper:

A strategy paper outlining proposed Project progress to the end of 2013 has been completed and passed to the Chairman and Bob Fry. This shows the projects procurement, funding requirements and engineering targets. The detail has been discussed with the Chairman following the Crewe meeting and targets and spending authorities have been agreed. By the end of 2013 Mike Cooper hopes to have the loco, tender chassis and tender superstructure all on No 4 Road.

Liaison for the County Day, 27 July, continues but the planning is ramping up. 6 volunteers to meet, greet and talk have come forward. The preceding workday, 20 July, will be used for preparation.

Locomotive Progress:

There was a successful progress meeting at Crewe on Wednesday 29 May. Work on the firebox was inspected, repairs to the laps within the boiler, new inner copper lower side sections, blanked-off LMS safety valve and weld repairs to cracks were all examined and discussed. It was noted that the foundation ring had been removed for reprofiling. After discussion, it was agreed that the target completion date for the firebox would be December 2013. There will be a pause before starting the boiler barrel. The meeting discussed the merits of the double rolled tube boiler rather than the traditional GW design. The safety valve pad needs to be cast and machined and fastened to the top of the boiler. It was agreed that KWG would complete the drawing and initiate patterns to produce a raw casting which would be supplied free issue. The project team will also provide free issue firebar brackets and a steam fountain mount. A requirement to fit a blow down valve on the firebox backhead, which is not present on the original 8F firebox, has been noted. Crewe have been notified and patterns located.



29/05/2013 - view of crown stays above the firebox.



29/05/2013 - front tube plate of the inner firebox within the larger Belpaire outer firebox.



29/05/2013 - patch welder to the top of the outer firebox covering the aperture for the LMS safety valves fitted to the 8F boiler.



29/05/2013 - weld repair to firebox.



29/05/2013 - Lap repair to the firebox plates.

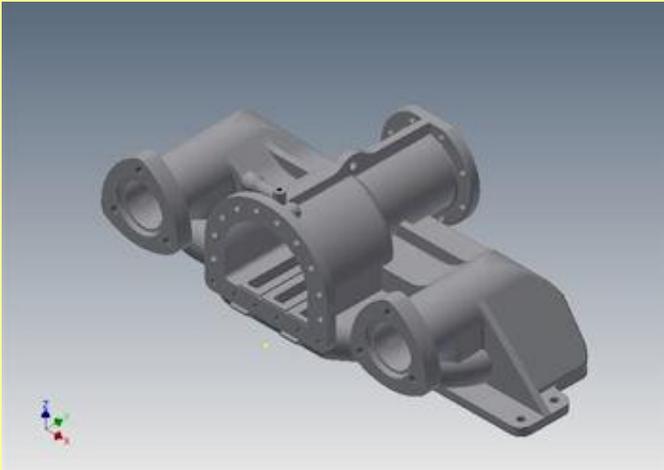


29/05/2013 - repairs to the firebox backplate.



29/05/2013 - Class 4 boiler barrel produced at Crewe - used to demonstrate the way forward for the Lot 354 Type 15OA boiler for 1014.

Preparatory work on the superheater header continues and after discussions with the Patriot Project we are intending to use a poly or resin pattern, like that produced for the Patriot Project, at a considerable cost reduction and will visit the factory in the near future. The GW drawing, albeit with a piece missing, has been located and both two-dimensional and 3D drawings have been completed. Use of poly-patterns is new ground for the Project, but it does open up considerable scope in the use of one-off patterns. There are still minor issues to solve but the next step will be to visit the company to discuss our requirements for this and other poly-patterns. It is our intent to test the procedure with a simple manufacture as the superheater is not required for another 24 months or so.

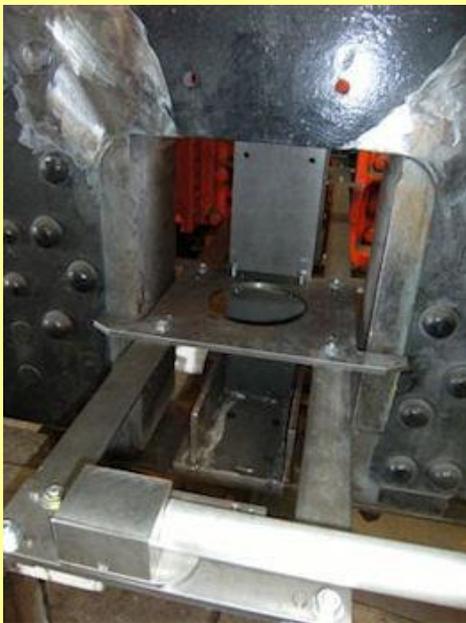


26/05/2013 - computer generated 3D image of the front of the three-row superheater header.



26/05/2013 - view of the poly-pattern produced for the 'Unknown Warrior' being prepared for casting. (Courtesy Unknown Warrior Project).

All parts of the hornguide jigs have been set up and minor repairs/adjustments undertaken. Measurements have now started.



26/05/2013 - horn guide jig installed.



08/06/2013 - measuring horn guide alignment.

To overhaul the main frame horn guides/axleboxes, a quotation of £1630 for each (of six) has been received.

Paint removal from the main frames is now almost complete - ND testing anticipated to be in June.

Although the driving wheels are painted, painting of the eccentric sheaves and axles in frame red is awaited.

A myriad of parts are being accumulated for the Cylinder Drain Cock Gear. To this end actuating rod rectangular steel bar has been delivered.

A convertible pattern for the right hand Cylinder Front Cover has been located. It is a bit 'distressed' and requires some repair but it is usable.



26/05/2013 - Pattern for RH Cylinder front cover.

Work continues on machining the front and rear valve spindle sleeves and the PB internals.

KWG and Mike Cooper are planning to visit the Arthur Stephenson factory in early June with regard to the outstanding forgings. It is expected that the three remaining eccentric rods will be ordered.

Having received their estimate for machining the outside motion it is intended to contract with Ufone for the machining of the lead coupling rods.

The cab continues to move well. The right hand window surround is now fitted and the revised number plate location is marked - required because of the height change on the cabsides. Work on the rear angle sandwich - the rear support, which supports the main roof, is complete with the fastening brackets welded in place. The two roof vents and their runners are fitted, consequently the main roof is complete, painted and has lifting lugs fitted. The next step will be to fit the rear roof support to the sides, which will be done on 15 June. Riveting the cab will probably be undertaken during workweek.



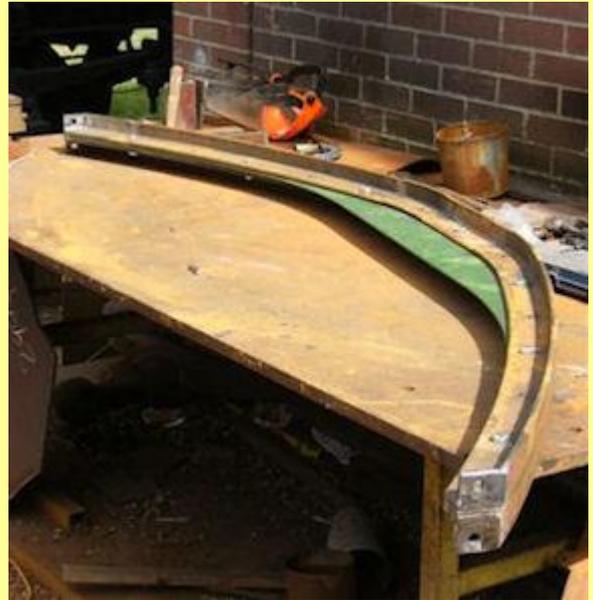
26/05/2013 - right cabside window fitted.



08/06/2013 - rear roof bracket being assembled.



08/06/2013 - cab roof in primer. Sliding vents fitted and lifting lugs in position - latter will be removed once the cab roof is fully fitted.



08/06/2013 - rear cab sandwich. Basically a shaped roof support for the rear end of the cab roof.

It is intended to try to fit the the nameplates by the end of June. Once everything is drilled, they will be returned to storage in Security.

Tender Progress:

The dragboxes & frame are now with Multi-Tech. KWG and Mike Cooper will visit in early June to discuss the forward strategy - the aim is to complete the frame assembly and for it to be back at DRC to start a new workstream by the end of the year.

The patterns for the tender brake cross shaft and accessories are complete. Having also completed the order paperwork, they have been delivered to Johnson Porter, a new, but highly recommended machine shop, in Stourbridge.



26/05/2013 - patterns for the tender brake shaft and accessories complete and ready for despatch to Stourbridge.

The brake hanger brackets have been fitted with their bearings and painted. The rear hanger brackets, of an entirely different pattern, are awaiting 3D treatment before being cast in BS 3100 A3 steel.

We have bitten the bullet on the vacuum cylinder piston and rod, the piston and rod are complete. The piston ring and wiper seal are ordered and now the supply of the securing strap is being investigated.

Also completed is the vacuum cylinder top cover.



26/05/2013 - completed vacuum cylinder top cover.

Gibbon/YAM2:



Terry Pattinson has completed the Gibbon frame and drilling the 22 mm holes in the frame. The 20 mm holes will be drilled next time. Discussions have taken place regarding fitting the axleboxes, ties and wear plates. Final completion is within sight.

26/05/2013 - Terry Pattinson with the completed Gibbon frame.

June

A busy month, mainly spent visiting suppliers and potential suppliers, firming-up procurement for parts essential for the successful completion of 1014, planning County Day, Saturday 27 July and Work Week in August. Notwithstanding this, observable progress has been made on the locomotive.

Locomotive Progress:

Visits:

1) Superheater - Mike Cooper and KWG spent 2 hours visited Premier Patterns in Birmingham. Better understanding of the process resulted and Premier Patterns have confidence the superheater casting using poly-pattern techniques can be successful. They observed that, in view of the complexity of the internal steam spaces, layering of the completed pattern will be necessary in order to fill with casting sand – a similar procedure to making a core. The County Project will test the procedure with the manufacture of the tender rear brake hanger brackets, a simple pattern.

2) Inside Motion - 3 hours were spent with Robert Stephenson MD of Arthur Stephenson Engineers (ASE). There were wide-ranging discussions about the order for the eccentric rods, leaving an original as a sample. These will be forged in BS 970 150M19. Also discussed was brake gear forging and fabrication of the replacement smokebox saddle. ASE has recently rebuilt their furnace and installed an 8 tonne hammer in their forging shop (see images) which will give it a capability entirely compatible to our requirements.



27/06/2013 - ASE's recently rebuilt furnace.



27/06/2013 -- ASE's milling table.



27/06/2013 - ASE's recently installed 8 ton hammer in the forging shop.



27/06/2013 - ASE's 1 ton hammer, KWG and Robert Stephenson.

3) Outside Motion - there was a successful meeting with Dave Mills, manager, of Ufone in Dudley. The only minor issue was the oil reservoir caps, which were outside the quotation. These will be completed internally and passed to Ufone as free-issue. A formal order was made 23 June with a target completion date around January 2014, which suits Ufone well. The RH Cylinder Front Cover saga continues! It is apparent the pattern in our possession is not accurate and the two covers in Security are too small. This may be another opportunity to use a poly-pattern.

Work has concentrated on the cab, now substantially finished with front and rear supports installed and both roof sections ready to fit. There are a few minor tasks such as the LH window surround, the handrail and a finisher for the RH cab footplate.

Work Week 2013 - hopefully a team will be fielded with a major tasks being stripping, fettling and reassembling, i.e. riveting the cab.



30/06/2013 - cab roof ribs fitted.

Brake Gear - In collaboration with Bob Fry, Mike Cooper has discovered in Security two, almost complete, sets of the forward pull gear for both a loco and tender brake gear. A final audit of components has still to be undertaken, but it appears 3 threaded brake adjusters and one long pull rod are all that require to be manufactured. It is estimated the Project has 90% of all the brake gear, but a drawing needs to be sought for checking. Discussions are in hand with regard to forging of outstanding items with Arthur Stephenson Engineers. Cleaning-up the recently acquired brake gear, will be another priority for Work Week.

Other work on the locomotive undertaken: Wheels - Painting the eccentric sheaves and axles in frame red is awaited.

Frames - Paint removal for the ND testing is almost complete. All being well, ND testing will take place during Work Week.

Main Frame Horn Guides/Axleboxes - A formal quotation for overhauling the 6 main axleboxes at £1630 each is awaited.

Nameplates - Fitted. Number plates will be fitted on 6 July.

Valve Spindle Sleeves - machining the front and rear sleeves and the PB internals continues.



30/06/2013 - nameplate fitted, meanwhile work on measuring the axleboxes.

Tender Progress:

Like the locomotive, tender progress has been dominated by visiting, planning and procurement.

Dragboxes & Frame - Mike Cooper and KWG visited MultiTech in Knottingley, West Yorkshire, having a 90 minute meeting with Richard Smith, the MD, who is still awaiting the commissioning of the new machine that will drill 1014's tender frames. A full pack of drawings was handed over and it was agreed that a works order for the drilling would be issued once a firm price has been received. A scope of works for tender assembly will be produced, which may then be priced, although it was agreed that a contingency percentage will probably be required, the management of which will have to be discussed with the Chairman. This will all be addressed in the next month or so, but it was indicated that the assembled underframe was required at DRC in January 2014 for component assembly to start.

Frame Support Sections - A very competitive quotation has been received from FabTech in Stockbridge who will fold and fabricate the 8 frame angles (1, 12 and 17) to our precise measurements rather than using the compromise of 356 mm hollow steel sections which have a +/- 0.6% dimension tolerance (2.1 mm). On completion, these will be consigned to Multi-Tech, who will fit them so they conform to the dragbox width.

Brake Hanger Brackets - The rear hanger brackets, of an entirely different pattern to the lead and centre, are awaiting 3D treatment before being cast in BS 3100 A3 steel.

Vacuum Cylinder Piston and Rod - The supply of the securing strap is still proving a problem, but the seal and ring have been delivered, courtesy of the 2999 Project.

Gibbon/YAM2:

Dicky B has made an extended 20 mm drill bit, which Terry P will use to drill the 20 mm holes on his return from sick leave.

And finally - The County Set.



29/06/2013 - Some of 'The County Set' workers at rest.

July and August

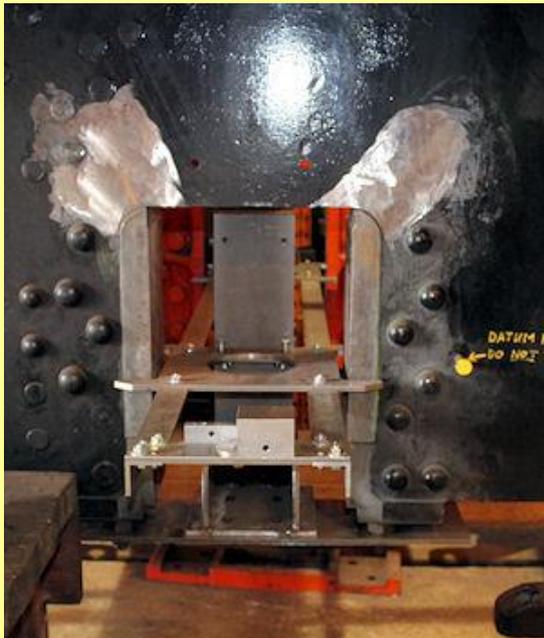
During July much of the Project's effort was focussed upon preparations for 'County Day', reported previously, nevertheless observable progress was to be seen on the locomotive itself, besides there being much activity 'in the background'.

On balance, County Day was a great success and many thanks to David Bradshaw for the idea and pulling it all together. The nameplate display was probably the first and last time that so many 38xx and 10xx plates have been displayed at one time. However, the mission of the day, to introduce 1014, and all that has been done on her, to the public was met, and most, if not all, the team spent time talking to visitors. Certainly, we were very busy around midday and it was excellent that the reporter from the Oxford Mail took some names and pictures – LaDonna was in the article.

August was dominated by a successful 'Work Week', and during both that and the rest of August, progress was steady and some notable, potential hurdles were overcome. A work force of between 4 and 7 a day was available during the week. Tasks completed were the cab roof and the cab floor closure plate. Measurement of the horns continued with an aim of repeating all measurements to get correlation.

Locomotive Progress

The main task prior to Work Week, was preparations for the non destructive testing of the frames. Layers of paint were removed from areas of potentially critical stress.



27/07/2013 - close-up of areas from which paint has been removed in readiness for non destructive testing. Frame measurement jig in-place for assessing alignment. *(Terry McCarthy)*



07/08/2013 - frames ready for non destructive testing the following day.

Alan Bartlett from Applied Inspection Ltd, Burton-on-Trent attended for 6 hours on 8 August. All points on the frame reckoned to be potential areas of cracking were cleaned to bare metal and subjected to a magnetic particle inspection. No cracks were detected in these key areas, so removing any concerns, which is a great relief. We will not be doing a Scotsman!

Using the jigs, measurements continue in order to achieve correlation. It is a slow process but correlation of the results is essential to give the initial results credibility. The frame was measured for 'out of true' and a maximum 5 mm was recorded.



27/07/2013 - laser fitted in cylinder shining towards the square block on the jig fitted into the horn guide. (Terry McCarthy)



27/07/2013 - jig fitting in horn guide - on the small square box, is a faint red circle just below a small hole - this is the laser light shining from the cylinder as shown opposite. When properly set-up (this was a demonstration) the deviation of the red light from the hole can be measured. Ideally, the beam should pass through the small hole. Such measurements are taken several times to ensure a consistent reading is achieved - vital for the machining process which will follow and ensure the correct alignment of the frames and horns, i.e. main bearings. (Terry McCarthy)

A formal quotation has been received Main Frame Horn Guides/Axleboxes from the Llangollen Railway for the overhaul of the 6 main axleboxes. The brasses for the horn and thrust faces are costed separately, but, if they all require replacement, there will be an additional cost to bear.



27/07/2013 - LaDonna, leader of the wheel painting team in deep discussion about the driving wheels with a visitor (Terry McCarthy)

Work Week saw the completion of painting the eccentric sheaves and axles in frame red, thus they are ready to go under the locomotive.

It has been discovered that the SVR has a pattern for a right hand cylinder front cover. A hire or loan is being investigated.

Work is proceeding on the cylinder blow down cock gear. The cocks are almost complete at Alexander Higgens, refurbishment is ongoing on legacy parts and the actuating gear is being welded up.

Valve Spindle Sleeves. Work continues on machining the front and rear valve spindle sleeves and the PB internals and the LG4 tube for the PB internals has been received.

Mike Cooper had a meeting with Dave Hunt on 4 July regarding the Vacuum Pump/Non-Ferrous Castings. A strategy was agreed, given that one of the core plugs is missing. His pattern maker has replicated the missing core plug and the cores will be made on 14 October with casting shortly afterwards in LG4 (at £5.80/kg, weight approximately 20 kg).



07/08/2013 - replacement core plug for the vacuum pump.

Arthur Stephenson Engineers are able to forge the missing parts of the brake gear. Work continues on the boiler. Drawings for the firebar brackets are complete for which wood pattern costs available, which are very competitive with poly-patterns, the centre bracket being convertible left to right, consequently an order has been issued. Johnson-Porter will be the prime contractor for the procurement. Work is complete on the drawings for the steam fountain mount on the top rear of the firebox. This is to fit the LMS firebox but is of a GW pattern. It will now be sent to Premier Patterns to discuss poly-pattern work. It is agreed the project will provide the brackets and steam fountain mount as free issue before the end of 2013.



The lance cock valve has been received, courtesy of Chris Denton. As Mike Cooper rightly says, 'it is a work of art!'

07/08/2013 - finished lance cock valve.

Julia Adams, who wishes to become involved with a project at DRC, has approached us and visited the project on Saturday 3 August and was briefed on 1014. Discussions took place on how she might be able to help the project and she agreed to help with CAD work, particularly 3D CAD, for the production of 3D drawings necessary for poly-patterns for the more complex parts that we have to manufacture.

The Project is collaborating with PG over the manufacture of an exhaust steam injector, offering to facilitate the castings at David Hunt Castings.

It would appear that the 4079 project has a casting for a 10xx live steam injector, detailed discussions with Drew Fermor will be undertaken.

The cab is substantially finished. The angles have been fitted to the rear roof. There are a few minor tasks such as the right hand handrail and a finisher for the right hand cab footplate. After that, decisions will need to be made as to how it will be riveted together for final assembly.

The cab roof is complete except for riveting and fitting of the storm sheet hooks. As it is estimated to weigh 700 lbs, movement from its current location to the cab roof presents a challenge and will require the attendance of a safety supervisor. Current intent is to mount the lifting lug at the C of G of the main roof, splitting it from the rear roof extension and get it as close as possible to the rear of the cab with the mobile crane. It would then be lifted with the 6 ton gantry crane.



27/07/2013 - cab awaiting attention during Work Week - dismantling and riveting. (Terry McCarthy)



03/08/2013 Rear section of cab roof, prior to fitting.



31/08/2013 - cab roof assembled

To complete the riveting of the cab, it is intended to use the repaired portable forge powered by coke and a supplier of forging coke in Marlborough has been contacted.

Tender Progress

Strategy:

It is intended that a bank of tender underframe parts is built up, so that work can begin immediately on building the tender underframe once the sub-structure is delivered back to DRC in early 2014. To this end, a water scoop support bracket and the pipe support brace from FabTech have been accepted recently, and delivery of the brake cross shaft accessories from Johnson-Porter.

12 drawings for fittings necessary to build the underframe are being sought, 11 have been located, but currently eluding us is Drawing No. 60086 Diaphragm Steam Trap.

Multi-Tech have confirmed the price, which is the same as 15 months ago, for the tender side and buffing plates and the works order for Phase 2, the drilling of these plates, was placed on 31 July.

An order for placed the order for Frame Angle Support Sections with FabTech in Stockbridge on 2 July and they were accepted on 29 July – excellent service from this small local company. The frame angles have been consigned to Multi-Tech, who will fit them as part of Phase 3, the tender underframe assembly.

A Phase 3 assembly guide document has been completed for Multi-Tech and the Project are proposing to attend the fit-up for assembly to ensure that no mistakes are made. A hard copy drawing pack will also be sent.

The Rear Brake Hanger Brackets were received on 22 August and will be machined in house.

With regard to the Vacuum Cylinder Piston and Rod, the piston ring, has been delivered, courtesy of the Saint Project.

Gibbon/YAM2:

Drilling of the 20 mm holes in the frame was completed in late July, thus assembly could begin in Work Week. Axleboxes have now been fitted and bearing caps test fitted using the new long bolts made by the Andover blacksmith. Subject to the availability of a crane, the wheels will be fitted on 28 September. Finally, the wear plates will be added and, subject to agreement, the Gibbon will be placed under the rear of 1014. This has been a saga, but worthwhile as Terry P is back on the project.



07/08/2013 - Yam frame bolted together with axle boxes fitted and bearing caps test fitted.



07/08/2013 - Yam bolts as received - at least 12" long.

For September the main effort must remain focused on wheeling. This will mean getting consistency in the horn measurements, prior to getting the axleboxes to Llangollen, and checking that all parts needed for wheeling are serviceable and ready to fit. Work will continue on mounting the roof and sorting out kit to rivet the cab sides as well as various brake components for the tender. Back office work will focus on the tender underframe plumbing and the steam fountain mounting for the rear of the firebox.

County Day - 27 July 2013

This special page is to commemorate the Project's County Day, celebrated on Saturday 27 July, the focus of which was a display of both Hawksworth and Churchward Counties nameplates, plus some cabside plates and a couple of smokebox number plates. It is unlikely that such a collection of County memorabilia has ever been assembled and it is unlikely to happen again

The County Project Group and GWS are very grateful to all who loaned items for the day - your generosity is appreciated. Thanks also to David Bradshaw who negotiated the loans of name and number plates and to Ian Wright for his assistance in locating the plates.



06/07/2013 - an early pair of arrivals - two County of Chester plates. The straight nameplate belonged to 1011 the last Hawksworth County to be withdrawn. The curved plate was fixed to 3814, a Churchward County built in 1906 and withdrawn in June 1933.

Interestingly, the GWR incorrectly rendered 3814's name as 'County of Cheshire' and were required to correct it in 1907. (Mike Cooper)

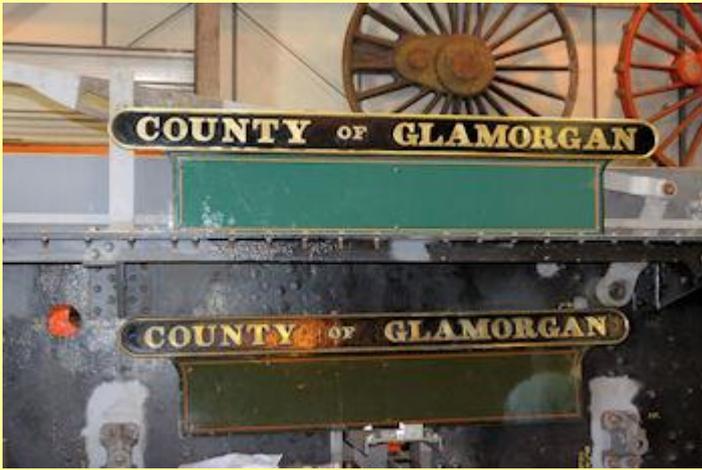
27/07/2013 - first display board erected.- plates from 1010, 1020, 1021, 1017, 1029 and 1015. (Terry McCarthy)



27/07/2013 - An original left hand side plate for 1014.



27/07/2013 - LaDonna polishing the original right hand plate for 1014, beneath the plate made by Gary Davies for the Project.



27/07/2013 - Gary Davies' replica plate on the footplate and that carried by the original 1014 during her lifetime. Slight difference in the shade or green?



27/07/2013 - the 'new' 1014 cab with number plate affixed.



27/07/2013 - outdoor display of Hawksworth County plates - on the farther board cabside plates, plus a tender works plate number 127 and three right hand side plates for 1002, 1027 and 1018.



27/07/2013 - later additions to the Hawksworth County display, 1012, 1011, 1002.



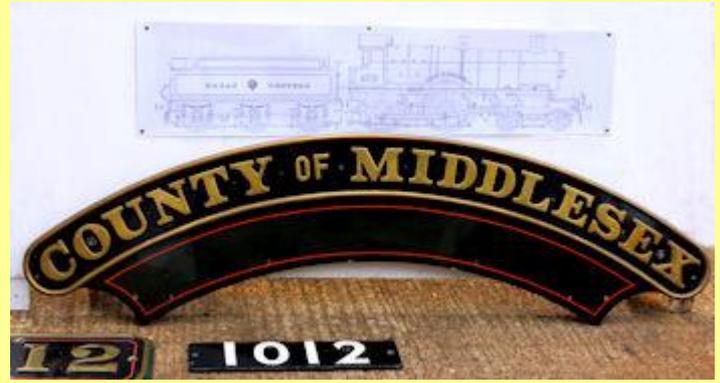
27/07/2013 - double chimney from scrapped County, 1006, donated to the Project in its early days shown with a left hand nameplate, cabside number plate and smoke box plate from the same locomotive - County of Cornwall scrapped in 1964 at Sharpness.



27/07/2013 - an array of Churchward County nameplates - 3807 County Kilkenny, 3814 County of Chester, 3824 County of Cornwall, 3473/3834 County of Somerset and 3476/3833 County of Dorset. 3833 was the first Churchward county to be withdrawn in February 1930, while 3834 was the last to be withdrawn in November 1933.



27/07/2013 - 3807 County Kilkenny (1906-1930) - surprise was expressed at the Irish names given to some Churchward Counties. These names were attached to locomotives built in 1906, when Ireland was part of the UK and the GWR had close ties with the Midland & Great Western Railway, consequential of the development of the Fishguard - Rosslare link.



27-07/2013 - County of Middlesex was the name of the first of the Churchward County class - plan shown above nameplate. This locomotive was built in May 1904 and numbered 3473 - she was renumbered 3800 in December 1912 and withdrawn from service in March 1931.
1012 is the smokebox plate from Hawksworth County - County of Denbigh.



27/07/2013 - David Bradshaw explaining things to the Chairman...



27/07/2013 - Some of the County Day volunteers - Mike Cooper on his knees and ready for his coffee break!

All in all a very good day, helped by the absence of the rain promised in the previous evening's weather forecasts and enjoyed by those who attended and helped out. One thing learned by most of us on the day, especially in the subway between DRC gate and the car park, County nameplates are heavy!!!

September

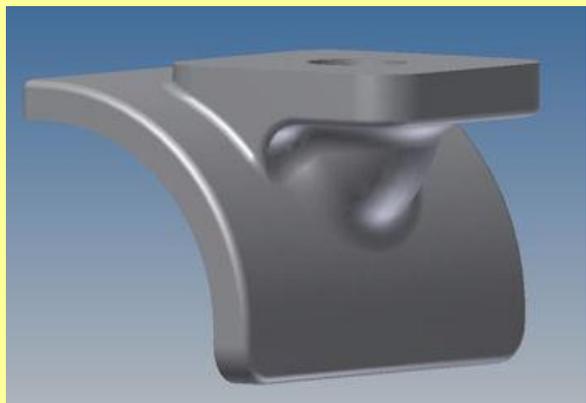
Progress remains slow but steady on all fronts, but the main achievement has been the fitting of the cab roof. Julia Adams is now working on the 3D CADs for poly-patterns.

Locomotive Progress:

Using the jigs, measurements continue in order to achieve correlation. This is a slow process but correlation of the results is essential to give the initial results credibility. Once complete the measurements and axleboxes will be despatched to Llangollen.

While boiler work continues at Crewe, drawings have been completed for the steam fountain mount on the top rear of the firebox, with Julia doing the conversion to 3D.

Premier Patterns have completed the poly-pattern. Casting is expected in early October and once formally accepted it will be sent to Crewe.



05/10/2013 - Julia Adams' 3D plan of the steam fountain mount.



05/10/2013 - Poly-pattern as produced by Premier Patterns.

Mike Cooper visited Hunt Castings on 16 September to review progress with the Vacuum Pump/Non-Ferrous Castings. The cores were causing a lot of problems but they were confident of finding a solution.



05/10/2013 - pattern for castings of the vacuum pump and its fittings.

All the LG4 tube for the PB internals has been received and work has started on the Valve Spindle Sleeves.

Work continues well with the Cylinder Blow Down Cock Gear and all parts are substantially completed.



05/10/2013 - cab roof successfully fitted - driver's pose being practiced!

Tender Progress:

Creation of a bank of low risk parts for 2014 work continues.

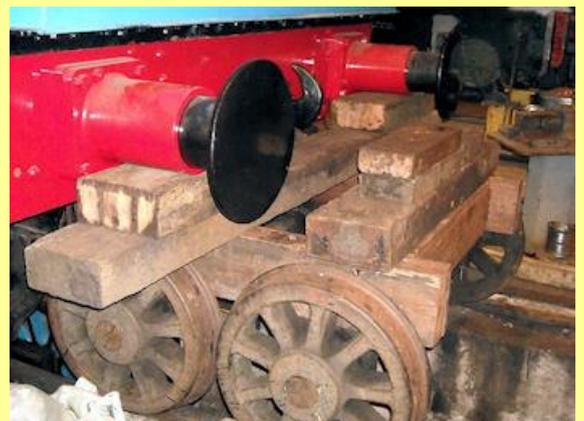
Delivery of the outstanding tender drawings from the NRM and Ted Lacey is still awaited. In spite of speaking to a number of contacts, Drawing No 60086 Diaphragm Steam Trap has not been located.

With regard to the Tender Brake Cross Shaft and Accessories, KWG is carrying out a tolerance audit to ensure that all three manufacturers deliver parts that will fit together – there is project risk here. The order for the production of the brake shaft is likely to be with Southern Engineers at Wantage.

Assembly Guide - There is some discussion as to how the use of metric bolts will be managed. The endstate will be round headed rivets or bolts, the choice being dictated by ease of access to riveting tools.

Yam:

The Gibbon, also known as the YAM 2, is complete and in use.



05/10/2013 - completed and in use.

October

Progress remains slow but steady, with good progress being made on the cab floor and cylinder blow down gear.

Good to see LaDonna back in harness despite the tongue lashing the crew received from her over the state of the Pooley!

A warm welcome to Maurice Luscombe, who has joined the project team and let slip that he has a machinist background. Gary D will initiate him onto the machines and get him operating!

Locomotive Progress

Measurements using the jigs continue in order to achieve correlation and on 2 November the last two sets of measurements to make on the front horns were completed. Final calculations are in hand, prior to despatching the axle boxes to Llangollen.

Various items are being prepared for the 'new' boiler.

The steam fountain mount has had to be modified with a strengthening web to the rear. It is expected to be cast shortly.

The manufacture of the seating for the manhole and safety valve, a large and heavy component has been discussed. KWG is preparing the AutoCADs for Julia to convert to 3D.



02/11/2013 - remodelled steam fountain mount showing strengthening web modification.



02/11/2013 - fire bar bracket patterns.

The patterns are complete and will be delivered in the very near future to Johnson Porter for casting.

The cock gear lever is complete. Once the cylinder apparatus is complete, we will polish the steel and get it plated in order to reduce corrosion.

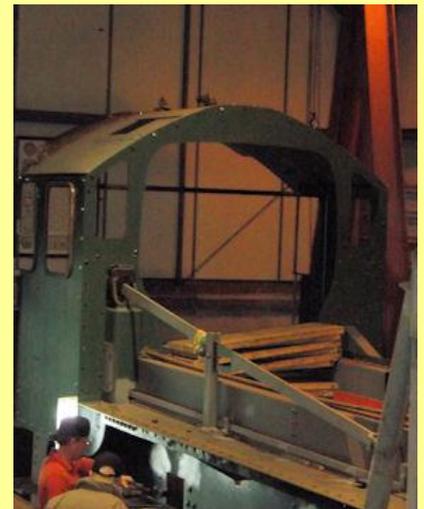


02/11/2013 - completed cylinder drain cock gear.

Work is progressing on the cab floor although there is some fettling to do on the roof. Terry P is making plywood templates in order to cut the chequer plate sections of the floor accurately. It is hoped riveting the cab sides will start in late November.



02/11/2013 - making and trial fitting the cab floor templates.



02/11/2013 - cab showing roof fitted.

The portable forge was commissioned on 26 October, not without difficulty, and assisted by Bob Fry. On 9 November there will be an attempt to repeat the building of the fire bed, using coal as the initiator. If successful, there will be a riveting weekend on 23/24 November 2013.



02/11/2013 - trial firing the portable forge.



02/11/2013 - Bob Fry helping to get the portable forge fire-up.

Tender Progress

Delivery of the outstanding tender drawings from Ted Lacey is awaited. Drawing No. 60086 Diaphragm Steam Trap, has still not been located in spite of a number of contacts. Work has begun to produce drawings for Drawing No. 45456 Drip Trap.

The tender brake cross shaft and accessories are expected to be complete by early November. An order for the brake cross shaft has been placed with Southern Engineers in Wantage.

The two tender front steps and two brackets (both handed) have been ordered from FabTech in Stockbridge.

Overhaul of the brake hangers has started in the same fashion as those for the loco.

It is hoped to start machining the rear brake hanger brackets in the near future.

The vacuum cylinder piston and rod are awaiting collection.

November and December

This report covers all activity during November and December 2013. Progress remains steady, albeit slow, with forward movement on the firebox, tender parts, cab floor and cylinder blow down gear.

Chris Cox is back in action, but on light duties. 21 December the County Set/Pendennis Castle Team joint Christmas party was held in the lifting shop.

Mike Cooper is acutely conscious that in 2013 about 2,000 hours has been put into the project, some 16% less than in 2012. It is necessary, therefore, to look at means of achieving greater productivity in the workshop; e.g. working every Saturday, albeit with a small team on non-workdays, besides being prepared to work an occasional full weekend for tasks like riveting, where the setup time takes a significant chunk of the working day. If road space in the Works can be secured there will be an attempt to open both tender work streams.

Locomotive Progress:

All measurements on the jigs have been made and correlation has been achieved, KWG has interpreted the results. He explains: "We built a frame jig system to go between each pair of horns, which could be lined up with the centre of the cylinder bore using a laser. Using a system of aluminium tube length rods, we first positioned the frame jig in the centre driving axle horns, which is the key point from which the lead and trail axles are positioned. With this accurately secured we were then able to position a second frame jig accurately in the rear coupled horns using the length bars and laser. It was then a simple matter of measuring the clearances around the gauging plates of the frame jig to the horns. We were thus able to accurately assess the wear on the horn and thrust faces. The rear frame jig could then be raised to give a top set of readings and lowered to give a bottom set. This done, the frame jig at the rear coupled axle was then transferred to the front coupled axle position and the process repeated. Thus we obtained a complete set of readings for both coupled axles. It now remained only to raise and lower the centre driving axle frame jig to obtain the full set for the whole loco.

The results of all these readings were then analysed and it was found that the distance between the rear coupled axle and the centre driving axle was 0.0025" too great and the front coupled axle to the centre driving axle was 0.026" too great. When the horns faces are reground it will be easy to rectify these errors. We will then have an accurately aligned main frame with all axles at their correct centre point."

Now the horn guide measurements are complete, the aim is to get the axleboxes away to Llangollen as soon as possible and brief Nichol & Andrew on the grinding of the horn guides. KWG has completed the access drawings.

Forging of the eccentric rods has started at Arthur Stephenson Engineers.



30/11/2013 - eccentric rod being withdrawn from the furnace.



30/11/2013 - Forging begins - hot eccentric rod in place for the forging hammer to do its work.



30/11/2013 - eccentric being forged.

Casting of Vacuum Pump/Non-Ferrous Castings was initially unsuccessful, but David Hunt is determined to get there! He completed another casting before Christmas, which has yet to be inspected.

The cock valves for the cylinder blow down cock gear were accepted at Alexander Higgens and are now at DRC for the blow down gear to be completed and assembled.

Work has now started to fit the cylinder blow down cock gear to the cylinder castings. 24 studs have been manufactured but we have not yet been able to locate suitable sized Taylor rings.

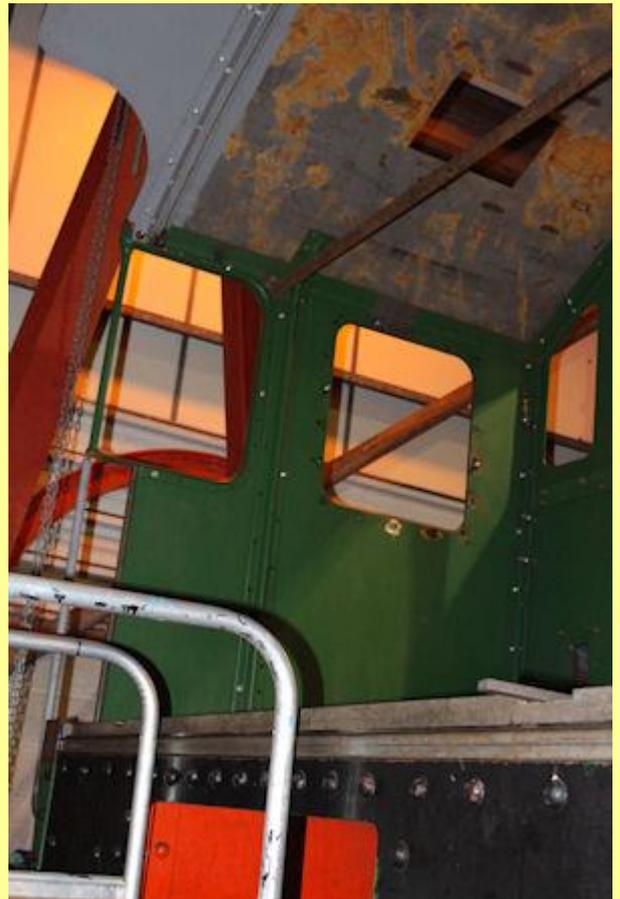


30/11/2013 - Completed cylinder blow down cock valves as received from Alexander Higgens..



21/12/2013 - Trial fitting bracket for the cylinder blow down cock gear

Regrettably, the deadline for riveting the cab was missed again because of the work on the cab floor. It will probably be February before a start can be made.



21/12/2013 - cab progress.

The Firebar Bracket Patterns are complete and their casting and machining have to be a priority as they are required by Crewe.

Manufacture of the seating for manhole and safety valve, a large and heavy component, has been discussed with Premier Patterns. The AutoCADs are complete and Julia has converted the AutoCAD file to 3D.



31/12/2013 - 3D image of the AutoCad file for the seating for the manhole and safety valve.



The steam fountain mount has been cast, and delivered to Crewe to be studded and welded to the firebox backhead.

KWG is now starting to refine his initial drawing of the Superheater so that it can be converted to 3D.

Regarding the boiler barrel, an exercise is being carried out to identify how much the parts element of the boiler barrel/smokebox build will cost. Given that the barrel and smokebox are all new work, and should be at a fixed price, so permitting better control the finances.

30/11/2013 - steam fountain mount casting.

A full set of brake pull rods for both the locomotive and tender has been selected. Work is now in hand to measure any wear in the bolt holes and straighten the rods where necessary. Those parts of the brake linkages not in store will have to be manufactured, as well as the bolts, the latter in EN 3C.



21/12/2013 - sets of locomotive and tender brake pull rods.



21/12/2013 - Joe, one of our younger team members, measuring the pull rod bolt holes.

Tender Progress

Overhaul of the brake hangers has started in the same fashion as those for the loco.

Machining of the rear brake hanger brackets continues.

Work has started to specify the sizes and quantity of the brake gear pins that secure all the brake rigging.

The vacuum cylinder piston and rod are awaiting collection.

The two front step plates and two brackets (all handed) have been accepted from FabTech of Stockbridge.

Machining of the frame plates has been completed at Multi-Tech. This task is now complete and Richard Smith is pricing the assembly. It is hoped that final assembly can start by mid-January 2014.



30/11/2013 - machining the tender buffing plate.



31/12/2013 - tender frames - machining complete.

Mike Cooper's end of year report on progress in 2013.

We are now 7 years into the project to recreate *No 1014 County of Glamorgan*, which started in June 2007, and it is, once again, time to take stock of where we are and where we will go in 2014.

During 2013, progress at Didcot has been slow but we have moved forward elsewhere, particularly at Crewe where our firebox inches towards completion. Regrettably, we missed, for the second year running, our main target of re-wheeling. We were not helped here with delays in delivery and difficulty in specifying the method of dimensioning and overhauling the main axleboxes, which is now solved. However, with the cab and roof substantially completed, albeit not yet riveted, 1014 is really starting to look like a County.

However, and this is very important to the future of the Project and its completion date, I am acutely conscious that the statistics in 2013 (see below) show that we are just not putting enough time into 1014. We must therefore look at means of achieving greater productivity in the shop if some of us are to see 1014 finished in our lifetime!! We need to look at working every Saturday, albeit with a small team on non-workdays, and also be prepared to work an occasional full weekend for tasks like riveting where the setup time takes a significant chunk of the working day.

It is also vital, and I said this last year, that we must ensure that every element of our activity from design, manufacture, machining, assembly and painting is to the highest standard and with a critical eye for detail.

Progress during 2013 was challenging, with delays to major elements of the project of between 6 and 12 months. On the personnel side, I am pleased to say that we have recruited Julia Adams from the nuclear industry, who is assisting Keith Gilbert in the creation of 3D production drawings for making poly-patterns, and Maurice Luscombe. Maurice comes to us with great experience in heavy engineering and has found a niche with Gary Davies in a newly created

machining team, which will enable better, and cheaper, productivity. We also welcomed George Hallett, an ex-BR engineman who served at 81E and did fire Counties. He came bearing gifts of GW parts, so was welcomed with open arms!!

Our boiler remains at Crewe. It is stripped, a buyer has expressed an interest in the 8F barrel, and the firebox overhaul is approaching completion. Planning has started on a key element of the new boiler barrel, the manhole for the safety valve, and the manufacture of free-issue parts such as the steam fountain bracket and the fire bar brackets is on-going. The boiler manhole drawings are complete and have been converted to 3D. The horn guides measurement jigs were eventually delivered, after an inordinate delay, and it has taken some 6 months to take the readings twice, the second for correlation. During this process, we discovered a slight bowing in the main frames which the experts judge, luckily, as insignificant. The frame was also tested for cracks; none were found. Work is currently in hand to specify the repairs to the axleboxes before they are shipped to Llangollen for overhaul. A team under LaDonna MacDonald completed the fettling of our wheels and they are now ready to fit. Another team under Terry Pattinson restored a Gibbon, which we intended to go under the rear of the locomotive frame to assist its movement around the Works, now postponed and in use under King George aka Thomas! Work Week saw a major effort on completing the cab roof and starting the cock gear linkage in earnest. The cab roof is now in position and work on the extremely complex floor has started. The smokebox lance cock machining was completed by Chris Denton and what a work of art it is! Work has continued on the overhaul of the tender brake hangers with new bearings and anti-rattle shims. An intimate search of the stores yielded more parts such as brake pull rods and the adjusters for both loco and tender. Various benefactors continue to gift us components and, in this context, I am most grateful to all our supporters for their continuing beneficence to the project. We have ordered the eccentric straps and rods as well as the machining of the front connecting rods. The drag link pins have been delivered. We are currently manufacturing a bank of tender components such as the brake cross shaft and its 4 crank arms as well as numerous brackets and frame angles which will go into a tender parts bank for next year. The tender vacuum cylinder cover has been machined, as have the 12 hornguides and the new tender draw hook has recently been delivered. All the parts necessary to build the tender underframe (side, front and rear plates, front and rear dragboxes, inner frame and 8 frame angles) have been assembled by our contractor and work has started on drilling and assembly.

Some statistics for you. As at early December 2013, 96,040 hits on the website – just under 24,000 hits during the 12 months beginning December 2012. Total project spend to date £499553; 2013 spend £145273. Total 1956 hours worked (2012 total 2333 hours), down 16%. Total support hours approximately 650, up 8% from 2012. Average 2013 workday turnout 9, down one on 2012.

Finally, thank you all for your efforts in 2013 and I look forward to your continuing support in 2014.