Stothert and Pitt Cranes on the Swanage Railway

The two cranes which are often seen in the siding opposite the platform at Norden Station were built in the late 1940s and early 1950s by Stothert and Pitt of Bath for use at the Southampton Docks. These cranes are known on the Swanage Railway as FBC1 and FBC2 but officially the makers numbers are CB5968 No1, 15 ton; and CC1011 No1 10 ton, respectively.

In 1983 crane FBC1 was the first to arrive on the Swanage Railway. It has played a significant part in relaying all the railway track from Herston through to the connection with Network Rail at River Frome, a distance of nearly nine miles. On top of this task FBC1 has also been used to install loop lines, sidings, bridges and signals and has also assisted with all manner of works associated with locos, carriages and many other tasks too numerous to mention.

Crane FBC2 was restored over a period of 5 years and is now in full working order including its self-travelling capability.

In about 1947 Stothert and Pitt commenced the build of three types of rail-mounted, self-propelled, diesel-electric cranes with lift capacities of 5 tons, 10 tons and 15 tons. One of each of the three types was delivered to the Southern Railway for use at the Southampton Docks where they commenced their working life. In fact it is known that FBC1 was delivered from the factory at Bath via the Somerset and Dorset Railway and that its journey was interrupted at Midford because it had developed a hot axle box[1].

Crane Specifications

Both Cranes are Standard Gauge, Diesel Electric with 2 x 4 wheel bogie truck. The Operating voltage is 480v DC from a 37.5kW onboard generator
A shore supply socket is provided.
On both cranes the revolving gear incorporates what is known as a live race with a roller path of about 8ft diameter.

Additionally:-

Crane FBC1 - CB5968 – Built in 1948
Lifting capabilities:-
14 tons at 16ft radius, or 2 tons at 45ft radius (unblocked)
15 tons at 30ft, or 7.5 tons at 45ft radius (blocked, with outriggers deployed)
Maximum radius 45ft
Minimum radius 16ft
Self propelling speed - 300fpm under its own power with a load of 15 tons
Control equipment:-
Slew motor - 8 BHP at 1000 rpm series wound
Luff motor - 12 BHP at 700 rpm series wound
Hoist motor - 30 BHP at 700 rpm series wound
Travel motors - 2 x 20 BHP at 700 rpm series wound

Crane FBC2 - CC1011 - Built in 1952
Lifting capabilities:-
$2^1/_2$ tons at 35ft radius or 10 tons at 17ft radius (unblocked)
5 tons at 35ft radius or 10 tons at 20ft radius. (blocked)
Maximum radius 35ft
Minimum radius 16ft.
Self propelling speed - 300fpm under its own power with a load of 10 tons
Control equipment:-
Slew motor 6 BHP at 1000 rpm series wound
Luff motor 12 BHP at 700 rpm series wound
Hoist motor 30 BHP at 700 rpm series wound
Travel motors x 2 - 16 BHP at 700 rpm series wound

Machinery and Electrical Equipment

- Both of the above Stothert and Pitt cranes, are fitted with a type DAA-4, 4 cylinder, water cooled, vertical diesel engine made by the National Gas and Oil Engine Company. This engine weighs 0.57 tons, has a $4^{1/8}$in bore, 6in stroke, and develops 54 HP. The normal operating speed is 1500 RPM and it is directly connected to a 37.5kw generator.

- Lancashire Dynamo and Crypto Ltd supplied the generator; and slew, luff, hoist and travel motors.

- The control gear including the operator's controls, crane protection panel, and resistor banks were manufactured by Allen West and Co Ltd.

- The generator control panel was provided by Foster Transformers and Switchgear Ltd.

- Electric braking components were supplied by Elevanja Ltd.

- Electrical Conduit and fittings were supplied by Simplex Steel Conduit Company Ltd

- Axle boxes were supplied by Robert Hyde and Sons Ltd.

- Wheels and Axles were manufactured by Bessemer and Co Ltd.

- Much of the steel was supplied by various well-known British companies.

Acquisition and Restoration

After many years of service at the Southampton docks the cranes were declared redundant and in 1983 the Swanage Railway was given the opportunity to purchase one of them. Representatives from the Railway visited the docks to inspect the 15 ton crane (CB5968) and considered it to be ideal for work on our railway and subsequently it was acquired for a sum of money in the order of £1600.

The 10 ton crane (CC1011) built around 1952 had already been transferred to Barry Docks where it suffered some damage after a protruding rail punctured the casing of one of the bogie travel motors. This damage was repaired and the crane was operated at Barry Docks for a further 2 years before being purchased by the Gwilli Railway where

it was used for a while. The 10 ton and 15 ton cranes are very similar in construction. The motors, engine, generators, control equipment and much of the chassis and running gear are the same on the 10 ton crane as on the 15 ton crane so when the Gwilli Railway decided to dispose of their 10 ton crane the Swanage Railway was initially approached to see if we would be interested in buying any of the parts for use as spares on our own similarly built crane.
Following discussions, the Swanage Railway agreed to purchase the complete crane for £1500.

Shortly after crane CB5968 had been delivered to the Swanage Railway work commenced to renovate it. This included refurbishment of the hoist motor. This had burned-out while in use at Southampton Docks, while it was supporting operations to load ships which were destined for the Falklands War. The damage contributed to the Docks management deciding to dispose of this crane to the Swanage Railway. A considerable amount of the internal wiring also had to be replaced during the refurbishment at Swanage.

The 5 ton crane which, unlike the other two cranes, did not have a bogie truck, ended up at Tyne Dock where it is believed to have been cut-up.

The three cranes were unique and although it is unfortunate that the 5 ton crane was cut up it is none-the-less a great asset, operationally and historically, for the Swanage Railway to have two of them.

Historical Notes

Some components of these cranes are built to drawings dating back to 1912.

In 1913 Stothert and Pitt delivered a 15 ton steam crane (S&P ref No A.A.333) to the L&SWR for use at the Southampton Harbour which, at that time, was owned by the London and Southampton Railway (LSWR).
An example of the re-use of component designs can be seen in the bogie spring drawings where the word 'Steam' is crossed out and replaced by 'Diesel Electric' and the original Stothert and Pitt crane reference number 'A.A.333' is crossed out and replaced by 'CB5968'
Similarly in the set of drawings for FBC2 the original Stothert and Pitt crane reference number 'CB5968' is often seen to be crossed out and replaced by 'CC1011'.
It has been noted that the axle boxes used on these cranes were also supplied to Ransome and Rapier who were another crane manufacturer.

From time to time, up until 1963, a Stothert and Pitt steam crane was stabled at Bournemouth railway shed.

A brief history of Stothert and Pitt

The company was originally formed in the 1785 by George Stothert. As time went by family members became involved and around 1844 a George Rayno became a partner along with Robert Pitt and was then known as Stothert, Reyno and Pitt but after George Reyno retired in 1855 the company became Stothert and Pitt. Over many years and several generations of Stotherts the company became a world renowned supplier of machinery with a particular emphasis on cranes.

The company grew until in 1945 it employed over 2000 people in Bath. It was world renowned for its dock cranes but diversified from time to time and has made everything from bedsteads to concrete mixers and road rollers to boilers. The company also manufactured the 17 pounder gun turret for the A30 Challenger tank. This was a British heavy tank design, produced in the early part of the Second World War and a prototype of the turret was fitted to an 80 ton prototype TOG 2 tank for trials[2]. A TOG 2 tank with its Stothert and Pitt gun turret is now preserved and can be seen at the Tank Museum at Bovington.

During WW2 Stothert and Pitt also made midget submarines, and manufactured minesweeper cutters, which were used to cut the cables which held the mines to the sea bed. The company's history goes back to before the Crimea war (1853 to 1856) and by the time of this war they were already well known as a company able to produce quality equipment. They came to the attention of Isambard Kingdom Brunel who was working on a Government order to supply a portable hospital to the Crimea and before long Stothert and Pitt received an order from Brunel to manufacture water supply equipment. This was one of the most urgent of orders placed during the war and as soon as the equipment was ready it was loaded onto an awaiting ship and rushed away to the Crimea.

The Stothert and Pitt Company still exists but is now a design and consultancy operation. The manufacturing works at Bath are now closed but the company still prides itself on its ability to maintain its cranes, no matter what their age, and they have so far been very helpful to the Swanage Railway, enabling us to be in a good position to keep both cranes operational for many years to come.

Further history about Stothert and Pitt can be found in a recent book entitled 'Stothert and Pitt:- Crane Makers to the World' ISBN 0752427946.

At some point the Stothert and Pitt company became part of the Hollis Engineering group, which was in turn taken over by the Robert Maxwell empire which later collapsed in suspicious circumstances. Today the Stothert and Pitt name exists but comes under the umbrella of Cowans and Sheldon, a company synonymous with the supply of railway cranes. Both companies are part of the Clarke Chapman Group within Langley Holdings.

Brief histories of the companies which supplied parts and materials can be found below:-

The National Gas and Oil Company Ltd was established at the Wellington Works in Ashton in 1889 by the pioneer of the gas engine, Henry Neild Bickerton. The company made many types of vertical engine for power plants in cotton mills and other factories and in 1907 became part of Mirrlees, Bickerton and Day Ltd. By 1929 it was one of the largest manufacturers of gas engines and oil engines in the world. Through various take-overs the company has been associated with other companies but notably it became part of the Brush Group in 1945. 'National' contributed significantly to the war effort having produced many engines for the Government and many other items including jigs for Lancaster bombers.
In 1947 the company went back into railway locomotive manufacture and produced diesel and diesel-electric locomotives in collaboration with W.G Bagnall Ltd of Stafford. Hawker Siddeley took over the Brush Group in 1957 then in 1961 Mirrlees Bickerton & Day Limited amalgamated with the National Gas & Oil Engine Company Limited to form Mirrlees National.
In 1969 Mirrlees National Limited and Blackstone & Company Limited, another Hawker Siddeley diesel company, were merged and the Company traded under the name of Mirrlees Blackstone Limited and so ended the 'National' name.
A little known fact is that before Kathy Staff[3] became famous as Nora Batty in 'Last of Summer Wine' her first job was at the National Gas and Oil Engine Company.

Lancashire Dynamo & Crypto Ltd is the company which supplied the generator and motors mounted in the two cranes. This company was formed in 1890 to manufacture electric motors and generators and traded under the name of Newton's. In the 1920's the company expanded and began the development of testing equipment for the motor industry and was later sold to Lancashire Dynamo and Crypto who wanted to expand their garage equipment interests and eventually the company was renamed 'Crypton'. Crypton is the recognised brand leader in engine diagnostics, engine tuning and engine emissions testing, with some 100 years of experience in testing engines.

Foster Transformers and Switchgear Ltd
The generator control panel was built by Foster Transformers and Switchgear Ltd based in South Wimbledon. They later became a subsidiary of Lancashire Dynamo Holdings Ltd.

Steel Manufacturers – various companies
Several names have been identified on the steel plates and jib including Dorman Long, Shelton Iron and Steel Co and the Skinningrove Iron Co.

Allen West and Company Ltd[4] was the original supplier for most of the switchgear on the cranes. They are a long established company based in Brighton, East Sussex, and have provided electrical control gear for many railway applications including Class 33 locomotives. They also supplied the electrical equipment installed in many Bournemouth trolleybuses.

Simplex Electric Company
This company, which was originally formed in 1898, as Simplex Steel Conduits supplied the steel conduits and fittings installed in the cranes to protect the 480vdc cables from mechanical damage. Simplex were based in Garrison Lane , Birmingham.

Robert Hyde and Sons Ltd
This company was originally based at their North Stafford steel works site in Stoke. The company is still in existence today although it has moved to new premises. The company was a steel founders and engineering company which manufactured and supplied axle boxes and bearings for many types of railway vehicles and they supplied the less common 12x6$^{1}/_{2}$ axle boxes as used on the Swanage Railway's Stothert and Pitt cranes. One of their main customers was British Rail Engineering Ltd (BREL) in Derby. BREL was taken over by Bombardier who subsequently closed the Derby works. In order to survive, Robert Hyde and Sons has had to move into other areas of work and now they only supply one item of railway related equipment for permanent way department use.

Elevanja Ltd
This company is now known as Johnson Elevanja. They are based in Bridgewater, Somerset. The company name is an abbreviation of Elliston, Evans & Jackson. The company provided the electrical braking equipment for the Hoist, Luff and Travel motors.

Bessemer and Co Ltd
The wheels, tyres and axles of the cranes were manufactured by John Baker Bessemer Ltd. The origins of this company go back to John Baker, who was born in Nottingham. He began work in Manchester, at the age of 12, and was to become the entrepreneur and founder of a company which was one of the largest manufacturing concerns in the area, with factories in Kilnhurst and Conisbrough.

John Baker was a railway wheel tyre and axle manufacturer.
He joined Thomas Burnett of Doncaster in 1874, having previously worked for George Owen of Rotherham.

Baker and Burnett's works was situated by the river Don in Conisbrough but in 1884, after the partnership was dissolved, John Baker moved to Brinsworth in Rotherham. He prospered and became a supplier to railways and tramways all over Europe and Scandinavia.

In 1903, he bought John Brown and Co's factory at Kilnhurst, where building started on an integrated steelworks, but while helping to clear the site in 1904, he caught pneumonia and died.

He had seven sons and during the First World War, the three eldest carried on the business under the Chairmanship of eldest son John W Baker and his brother Managing Director George Baker, while their brothers completed their education
In 1927, they bought out Sir Henry Bessemer's Sheffield company, and took the name the company bore until it was absorbed after takeover bids in 1964.
The company had helped the war effort of the Second World War by supplying munitions and tanks.

Henry Baker, one of the twin sons of John W Baker, was the company's last chairman and lived in his latter years at Thrybergh, dying in Devon at the age of 94

Crane CB5968 lifting the tank of the chassis of the T3 Locomotive tender

Acknowledgements

Considerable information about the history of several of the companies mentioned above has been found at the Grace's Guide website, Grace's Guide Ltd is a charity (No.1154342) for the advancement of education of the history of Industry and Engineering in the UK. See https://www.gracesguide.co.uk/Main_Page

References

1 Howard Fry (Head of Swanage Railway Permanent Way Dept at the time) visited Stothert and Pitt to discuss with them the use of the crane at Harmans Cross with only one outrigger deployed. While he was there he heard this story about the hot axlebox at Midford.

2 See Railway Steam Cranes by John S Brownlie 1973 - ISBN 0 9502965 0 3 Table IX
Papers of Lt Col Sir Albert Gerald Stern, KBE, CMG (1878-1966)
King's College London
Liddell Hart Centre for Military Archives

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STERN: 6 Film, 1918-1957

STERN: 6/3 1942

Roll of 16 millimetre film, a copy made by the Imperial War Museum of a 35 millimetre nitrate film. The film shows trials on the testing ground at the works of William Foster and Company, Lincoln, Lincolnshire of the TOG 1 tank (without turret) and of the TOG 2* tank mounting a 17 pounder gun in a turret manufactured by Messrs Stothert and Pitt Limited, Bitton, near Bristol, Gloucestershire and intended for the Challenger tank. The film particularly demonstrates the manoeuvrability of the turret of the TOG 2* tank. Duration 10 minutes.

3 Kathy Staff - See https://www.imdb.com/name/nm0821220/bio

4 Allen West Company wound up on 21/4/2017

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