= Stella power stations =

The Stella power stations were a pair of now @-@ demolished coal @-@ fired power stations in the North East of England that were a landmark in the Tyne valley for over 40 years . The stations stood on either side of a bend of the River Tyne : Stella South power station , the larger , near Blaydon in Gateshead , and Stella North power station near Lemington in Newcastle . Their name originated from the nearby Stella Hall , a manor house close to Stella South that by the time of their construction had been demolished and replaced by a housing estate . They operated from shortly after the nationalisation of the British electrical supply industry until two years after the Electricity Act of 1989 , when the industry passed into the private sector .

These sister stations were of similar design and were built , opened , and closed together . Stella South , with a generating capacity of 300 megawatts (MW) , was built on the site of the Blaydon Races , and Stella North , with a capacity of 240 MW , on that of the former Lemington Hall . They powered local homes and the many heavy industries of Tyne and Wear , Northumberland and County Durham . The large buildings , chimneys and cooling towers were visible from afar . Their operation required coal trains on both sides of the river to supply them with fuel and river traffic by flat iron barges to dump ash in the North Sea . After their closure in 1991 , they were demolished in stages between 1992 and 1997 . Following the stations ' demolition , the sites underwent redevelopment : the North site into a large business and industrial park , the South into a housing estate .

= = History = =

= = = Development = = =

The British demand for electricity increased after the Second World War . In the North East of England this led to the expansion of existing power stations at Dunston and Billingham in the late 1940s , the two new Stella power stations , and the construction of two more large stations built at Blyth later in the 1960s . This new generating capacity quickly met the demand for power . The British Electricity Authority were granted permission to construct the Stella North and Stella South power stations in 1951 . The two stations were originally projected to cost around £ 15 @,@ 000 @,@ 000 .

The site chosen for Stella North was the Newburn Haugh , which was the site of Lemington Hall . Lemington Hall was demolished in 1953 during the construction of Stella North . Stella South was built on the Stella Haugh , the site of the Battle of Newburn in 1640 . A cannonball from the battle was on display in the South station for many years , after having been dredged from the river bed . Between 1887 and 1916 , the Stella Haugh had been the site of the annual Blaydon Races , which stopped after a riot broke out following allegations of race fixing . Just before the construction of the South station the haugh had two uses . Blaydon Rugby Club 's ground had been there since 1893 , but in 1950 it was compulsorily purchased by the British Electricity Authority for £ 1 @,@ 000 . The club moved to a new ground in Swalwell , which it still uses . Newcastle University Boat Club had owned a boathouse on the site since 1929 , but in 1951 the British Electricity Authority requisitioned it , forcing the club to move upstream to its current location in Newburn .

The addition of various power lines was needed to connect the power stations to the National Grid . These included a 275 kilovolt (kV) connection from Stella to West Melton , and another 275 kV connection from Stella to Carlisle . The towers for these connections were to stand at 115 feet (35 m) , rather than the 85 feet (26 m) towers of the existing grid system . The line from Stella to Carlisle , which was to consist of 250 towers spaced at 320 meters over a distance of around 60 miles (97 km) , came up against opposition when first proposed . The Northumberland County Planning Authority launched a public enquiry in 1951 , and Hexham Rural District Council held a meeting . The Ministry of Agriculture and other outdoor associations voiced their concerns , as it was feared that the line would interfere with good farming land . An alternative route was proposed , but

in view of its additional cost of £ 72 @,@ 000 it was turned down , and the Ministry of Fuel and Power gave the line the go @-@ ahead .

= = = Construction = = =

Both of the stations were designed by Newcastle upon Tyne @-@ based architects L J Couves & Partners , and construction work began in 1951 . The Cleveland Bridge Company were contracted to construct the steel frames for the stations ' main buildings , including their turbine halls , boiler houses , workshops and stores buildings . Various other companies were contracted for the construction of other parts of the station . Sir Robert McAlpine & Sons were contracted for site clearance , provision of the foundations for the main and ancillary buildings , as well as the diversion of streams and sewers . Davenport Engineering Co. were responsible for the construction of the North station 's cooling towers , as well as the stations ' ancillary buildings . P.C. Richardson & Co. built the stations ' brick chimneys . Aiton & Co. installed the stations ' low @-@ pressure piping equipment . Underwater electrical work was carried out by British Royal Navy frogman Lionel " Buster " Crabb , chosen for the dangerous job because he wore a rubber diving suit at a time when most divers used canvas .

The first generating sets of the stations became operational on 20 December 1954 . However , it was not until 1956 that all four of the North station 's units were commissioned , and 1957 before all five of the South station 's units generated electricity . The cost of the two stations in total came to around £ 40 @,@ 500 @,@ 000 .

On the morning of 14 December 1955 , during the stations ' construction , switchgear exploded in the South station 's substation , closing down the generators . Dunston power station could not take the extra load and it also shut down , creating a total blackout on Tyneside . Around 400 @,@ 000 people were affected by the fault , including 20 @,@ 000 miners trapped in over a hundred collieries . Power was fully reconnected by that evening. but the failure caused an interruption of work and services worth more than £ 1 @,@ 000 @,@ 000 , as well as the loss of 300 megawatts of electricity .

= = = Post @-@ commissioning = = =

Although developed by the British Electricity Authority , the stations were first operated by the Central Electricity Authority , following the Electricity Reorganisation (Scotland) Act 1954 . From 1957 they were operated by the Central Electricity Generating Board (CEGB) , following the Electricity Act 1957 .

In 1961 , Stella North was presented with the Hinton Cup , the CEGB 's " good house keeping trophy " . The award was presented by Sir Christopher Hinton , the first chairman of the CEGB . The station 's achievement was attributed to the fact the station 's annual efficiency had never been less than 29 @.@ 1 % . The station also won the North East regional award for the second year in a row in 1961 . In March 1967 , Stella South 's male first aid team won a national first aid competition in Harrogate , organised by the CEGB . Over 150 teams took part .

In 1966 , Stella North was at the centre of a legal case in which three men were found guilty of conspiracy to defraud after trying to sell the CEGB poor quality coal when contracted to deliver high quality coal . The three men involved were D.C.P. Brooksbank , a salesman for a coal firm ; J.W. Patterson , a sampler at the power station , and M. Ridley , a contractor . Their scheme was for Patterson to substitute samples of reasonably good coal for the samples of poor coal taken from the lorries . However they were found out only two days after starting the scheme , when a foreman at the station saw Patterson dropping a bag of cement into the sampling bin , and reported the incident . Ridley was found to have planned the fraud , and was jailed for a year , while Brooksbank was fined £ 150 and Patterson £ 75 .

= = Design and specification = =

The main visible features of the stations were their large boiler houses , turbine halls , cooling towers and pairs of chimneys ; other facilities on both sites included offices , coal sorting areas , small fire stations and workshops . The power stations had the " brick @-@ cathedral " style of design popular for power stations in the 1930s and 1940s and , as of 2009 , still tenuously surviving at Battersea power station in London .

The main buildings of the South station had a total length of 130 m (430 ft) and a width of 81 m (266 ft) ; their tallest point , the roof of the boiler house , was 44 m (144 ft) high . The main buildings of the North station were of a similar length and height , but in total slightly narrower as the station had one less generator unit . This also meant it had a smaller generating capacity ; it was sometimes erroneously termed the South station 's " B " station .

The boiler houses and turbine halls were all @-@ welded steel structures , consisting of box @-@ type main columns and roof girders , clad with brick and glazed in parts . Each of their four chimneys was made of brick and stood 120 m (390 ft) tall , weighing about 5 @,@ 000 tonnes . The North station 's four 73 m (240 ft) cooling towers were made from reinforced concrete and were of the typically hyperbolic , natural @-@ draft design .

The South station had five generating sets and the North station had four . Each generating set had a bunker for 1 @,@ 250 tonnes of coal , fed by a conveyor from the coal store . This conveyor belt system was built by E. N. Mackley & Co , Gateshead . Each bunker fed coal into a pulveriser , manufactured by Raymond . From here it was fed into a boiler in powder form and burned . All of the boilers were suspended from the boiler houses ' steel frames , and were made by Clarke Chapman Group Ltd , Gateshead . The boilers were forged in Sheffield , the first of the nine arriving at Stella South in 1953 . At 62 tonnes , the boilers were at the time the largest ever made in the UK . The boilers were of the radiant @-@ heat type , comprising a water @-@ cooled combustion chamber , controlled @-@ type superheater and an economiser . Each of the boilers had an evaporation rating of 550 kL / h , a steam pressure of 950 psi and a steam temperature of 925 ° F. Each boiler was equipped with two forced and two induced Howden fans , twenty @-@ two electrically operated Clyde soot blowers , an automatic control system made by Bailey and Sturtevant electrostatic precipitators . Each station was designed to burn 2 @,@ 000 tonnes of bituminous coal a day .

Each boiler powered a turbo generator , made by Parsons , Newcastle upon Tyne . These were three @-@ cylinder reaction type steam turbines operating at 3 @,@ 000 rpm , generating 60 MW of electricity . The stations used them because of a Statutory Order of the Ministry of Supply in November 1947 that all turbo alternators made for the home market could only be of 60 MW at advanced steam conditions . Stella South had a total generating capacity of 300 MW and Stella North originally 240 MW (later recorded as only 224 MW) . The stations were the first to use silica removal beds in their turbines , a development which became standard within the CEGB 's power stations for some time . In 1967 , one of the sets at Stella South became the world 's first in commercial operation to use brushless excitation . The set was modified by Parsons to use A.C. exciters and silicon diode rectifiers . The stations ' switchgear was manufactured by A. Reyrolle & Company .

The power stations were illuminated by what was then the most powerful lighting installation in North East England . The North station was lit up by 60 flood lights , 15 on each of four towers ; the South station also had four towers , but each held 26 flood lights . The Central Electricity Authority justified the use of 194 flood lights over the two sites as " economical , safe and much more efficient than lighting the stations at street level " .

= = Operations = =

= = = Coal transportation = = =

The stations were in the heart of the North East coal field , which at the time of their opening had hundreds of collieries . Coal was delivered straight to the stations by rail . The Newcastle and Carlisle Railway was used for the South station , where 22 railway sidings were built . Trains could

only enter the sidings when travelling in a westerly direction .

The Scotswood , Newburn and Wylam Railway (SN & WR) supplied the North station , trains reaching the power station via a junction at Newburn . Despite the SN & WR 's closure on 11 March 1968 , and the rerouting of the Newcastle & Carlisle Railway through Dunston in 1982 , the track between Scotswood and Newburn was retained for supplying the North station , as well as for rail access to the neighbouring Ever Ready battery factory and Anglo Great Lakes Graphite Plant . The tracks outlived the power stations , and were finally lifted when the Ever Ready factory shut down in 1992 . Part of the line serving the station is now a well @-@ used section of the Hadrian 's Way National Trail .

A small home fleet of locomotives was used to shunt the coal wagons once they had arrived at the stations . Originally this included Robert Stephenson and Hawthorns 0 @-@ 4 @-@ 0ST No.20 and No.21 , and Sentinel No.25. Engine No.25 was used exclusively at the North station , but was converted to diesel @-@ hydraulic by Thomas Hill of Kilnhurst in 1967 , becoming Thomas Hill 188 . It returned to the station but was taken out of use in 1983 and scrapped by C F Booth of Rotherham . After the closure of the stations , engine No.21 was sent to be preserved at the Tanfield Railway site , near Sunniside in Gateshead . During the 1970s the steam locomotives were replaced by diesel locomotives . These included a Fowler 0 @-@ 6 @-@ 0 and CEGB No. 24 Vanguard 0 @-@ 4 @-@ 0 CEGB No. 24 has since been sent to Statfold Barn Railway for preservation .

The stations were picketed during the UK miners ' strike of 1972 , stopping coal deliveries to them .

= = = Cooling system = = =

Water is essential to a thermal power station to produce the steam needed to turn the steam turbines and generate electricity . Water cycled through the Stella stations ' systems was taken from the River Tyne ; after use it was cooled before being discharged back into the river . The North station 's water cooling system consisted of four large 60 @-@ cubic @-@ metre (2 @,@ 100 cu ft) natural draft cooling tower units , 73 m (240 ft) tall and made of reinforced concrete . The South station used a syphon cooling system instead of cooling towers , consisting of five 300 @-@ cubic @-@ metre (11 @,@ 000 cu ft) units , made up of five underground pipes , each 2 @.@ 1 metres (6 ft 11 in) in diameter , with valves and screens .

= = = Ash removal = = =

Fly ash and bottom ash are two by @-@ products from the burning of coal in power stations . Ash from the Stella stations was taken out to sea by three flat iron barges : Bobby Shaftoe , Bessie Surtees and Hexhamshire Lass . All three were built by Charles Hill & Sons of Bristol , in 1955 . Bessie Surtees was the first to be put into service , in April 1955 . On each trip , each ship took up to 500 tonnes of ash from the stations down the river and dumped it in the North Sea , 4 @.@ 8 km (3 @.@ 0 mi) off the coast . Originally , they carried ash waste from Dunston power station as well . Their frequent passages made them a common sight on the Tyne . Each was 46 m (151 ft) long and 10 m (33 ft) wide , weighed 680 tonnes , and had a crew of seven . They were managed by Stephenson Clarke Shipping Ltd but owned by the CEGB . The ships went further up the Tyne than did any other , and so needed a shallow draft . The entire load of ash was dumped through two hydraulically operated doors in only a few minutes .

As early as the 1960s , the power stations ' operating hours were decreased due to the opening of the much larger Blyth power station in Northumberland . This meant that less ash was produced by the Stella and Dunston stations ; so by the end of the 1960s , the CEGB sold Hexhamshire Lass and Bobby Shaftoe . The former went to a firm in Fareham , Hampshire , where it worked as a sand dredger until scrapped in 1993 ; the latter to a French dredging company .

After the closure of Dunston Staithes in 1980 , the Swing Bridge downstream of the stations seldom had to be opened . (Because Bessie Surtees was low lying , it was able to pass underneath the bridge at low tide .) However , on 15 December 1975 , Bessie Surtees collided with the Swing Bridge , forcing it to close for the rest of that weekend .

= = Environmental impact = =

When built , the power stations were fitted with electrostatic precipitators , to reduce the amount of smoke and dust emitted from the stations ' chimneys . At the time , this was the most up @-@ to @-@ date method to prevent pollution from power stations .

Despite these precautions , pollution from the power stations was still a factor . In 1954 , consideration was given to scrapping the plan to build the Union Hall housing estate in Lemington because of probable pollution from nearby power stations . This was mainly because some of the houses were as high as , if not higher than , the power stations ' chimneys . At times , this meant the estate being exposed to as much as 1 @.@ 25 parts per million of sulphur dioxide . However the estate was still built , as these peak conditions were thought unlikely to occur on more than 18 days in a year .

Smoke was not the only thing emitted from the power station . In July 1956 , the discharge of cooling water from the stations was noted to have increased the water temperature of the river by 1 @.@ 5 ° C between Ryton and Scotswood . However , this was found to not be too deleterious , as it did not seem to affect the passage of migratory fish . In fact , because of the stations ' introduction of warm water into the river , basking sharks were known to be attracted to the area .

From the start , the power stations ' fly ash was dumped in the North Sea , and 800 @,@ 000 tonnes of fly ash were dumped between the Stella and Blyth stations in 1976 . By 1991 , National Power 's licence had been restricted to dumping only 50 @,@ 000 tonnes of ash a year from the Stella power stations . By this point the North East coast was the only place in Europe to dump fly ash at sea . Fly ash dumping had been found to make sea bed inert , with much life being smothered and killed by the fly ash . It was also found to create problems for the fishing industry , when their trawlers caught large lumps of it . The licence for Stella was terminated in May 1991 , with the stations ' closure . Blyth power stations ' licence was terminated by the end of 1992 , ending fly ash dumping in the North Sea .

= = Closure and demolition = =

= = = Closure = = =

By the mid @-@ 1980s closure of the stations was being considered , and in 1984 , was considered for a combined heat and power scheme . After the privatisation of the Central Electricity Generating Board in 1989 , the stations passed into the ownership of National Power . After almost 37 years of use they were decommissioned in May 1991 as outdated and uneconomical to operate . They had been overtaken technologically , and had lower generating capacity than newer plants such as Drax . Their closure coincided with that of a large number of coal mines in the North East of England , just after the privatisation of both the electricity industry and the National Coal Board in the early 1990s .

Following the closure of the power stations at Stella , as well as those at Dunston and Blyth (in 1981 and 2001 respectively) , the northern part of North East England has become heavily dependent upon the National Grid for electricity . However , in the South of the region there are still two large power stations , at Hartlepool and Wilton .

The stations ' closure also forced the Tyne Sea Scouts , who had operated from the North station since 1978 , to seek new accommodation . The scouts had moved into the station when their boat house in Blyth was deemed unsafe and demolished . They had been provided with two site offices , storage in the power station complex , and permission to keep their boats at the North station 's jetty , at the end of which they had a slipway built .

= = = Demolition = = =

The large buildings and structures of the stations were demolished in stages throughout the 1990s . The four cooling towers were demolished by explosives on 29 March 1992 , in front of thousands of spectators . St Paul 's Developments then bought the two sites from National Power in 1993 . Both stations were demolished by T. W. Ward Industrial Dismantling of Barnsley , which started with the South station , whose twin chimneys were destroyed on 29 October 1995 by 82 kilograms (181 lb) of explosives . Its turbine hall followed , before the boiler house went on 1 February 1996 . Stella North then stood alone for almost a year before its turbine hall was demolished on 27 January 1997 and its bunker bay building was demolished on 22 June . The boiler house followed straight after , but its complete destruction took three attempts . Most of it went on 22 June ; the rest followed over the next two days . Its two chimneys , the last obvious reminder of the Stella power stations , were pulled down a month later on 27 July .

The power stations were among the last remaining heavy industrial buildings in modern Tyneside , and their demolition was felt by many Tynesiders to have marked the end of industrial Tyneside . The National Trust was then uninterested in the preservation of modern structures such as this .

= = Redevelopment = =

= = = North site = = =

= = = = CCGT power station proposal = = = =

In 1997 there had been plans for a £ 130 million combined cycle gas turbine power station on the site of the Ever Ready battery factory to the West of the site of the North station . AES Electrical applied to the Department of Trade and Industry for permission to build the station , which would have been twice as efficient as the coal @-@ fired Stella stations and the first major electricity generation site built in Tyne and Wear in over 40 years . The station would have had a generating capacity of 350 MW . It would have taken three years to build , and created 400 construction jobs , as well as 40 full @-@ time jobs after construction . But the proposal was opposed by the coal mining industry and dropped .

= = = = Newburn Riverside = = = =

Shortly after the North station was demolished , its site was reclaimed along with the site of the neighbouring Anglo Great Lakes Graphite Plant . The plant had made high @-@ purity graphite for use in magnox nuclear reactors , and operated using the North station 's available excess generating capacity , as large quantities of cheap electricity were essential for production . It was demolished around the same time as the stations , and left the site littered with graphite blocks . At 93 ha (230 acres) , the reclamation of the two neighbouring sites was one of the UK 's largest land reclamation schemes ; it was completed in 2000 . This made way for an industrial / business park , Newburn Riverside , the first phase of whose construction was completed in 2005 . As of 2009 it was still expanding , and expected to provide 5 @,@ 000 jobs and £ 116 million of private sector investment once completed . The park has a 4 km (2 @.@ 5 mi) cycle route and nature trail around its edge , which takes visitors , walkers and cyclists beside the river and past the point in which the North station 's cooling towers once stood . One of the buildings in the business park was named Stella House , as a tribute to the power station . It is occupied by One NorthEast , the regional development agency for the North East of England . In early 2012 , Stella House became the National HQ of the NHS Business Service Authority following the winding down of One NorthEast . Little else commemorates the power stations , but they are briefly mentioned in a plaque on Stella Road near the South station 's site marking the Blaydon Races : " Official racing started in 1861 on Blaydon Island which lay North of here . The song was written in 1862 . From 1887 to 1914 the race course was on Stella haugh , the site of the former power station . "

As well as the NHSBSA , the other key occupiers of the Newburn Riverside site are DEFRA , North East Ambulance Trust , MacFarlane Packaging , True Potential LLP , Northumberland and Tyne & Wear Strategic Health Authority and Stannah Stairlifts .

= = = South site = = =

Following the completion of the South station 's demolition in 1996 , thousands of pounds were spent on a number of security measures ; the site was fenced off , bunding was installed , warning signs were put up and security patrols took place . However , large sections of the fencing were stolen and the warning signs were ignored . Ultimately this led to one man being trapped on the site for five hours on 22 May 1997 . He had been looking for scrap metal and power cables , and had climbed through a small hole into an underground room , from which he had to be rescued by fire crews . The site was then designated a danger zone . The derelict site was vandalised in July 1999 , when people hurled burning tyres into the sub @-@ station , creating a fire and damaging cables worth £ 150 @,@ 000 .

= = = = Riverside Crescent = = = =

As of 2007 , the 14 ha (35 acres) site of the South station is under redevelopment , after having sat as a brownfield site for almost 10 years . St Paul 's Developments , the site developer , had often applied for planning permission to build housing and leisure facilities on the site over the course of six years , only to be refused . It was finally granted permission to begin building a £ 4 @.@ 7 million housing estate on the site in 2007 . Named Riverside Crescent , this is being constructed by Barratt and Persimmon . It will have 522 residential units , from two @-@ bedroom flats to five @-@ bedroom houses , as well as 1 @.@ 6 ha (4 @.@ 0 acres) of open space , a riverside walkway and a restaurant . A new bus link to Blaydon will improve transport links . The plans for the residential development first went on display at Stella RC Primary School on 5 October 2005 . Other proposals for the site had included industrial development , which met opposition , and restoration to grassland , seen as unfeasible .

Despite the demolition in 1996 of all of the above @-@ ground structure of the South station , foundations , culverts and more remained . These needed to be removed before construction could start . The removal of these underground structures was completed in early 2007 , whereupon construction of the houses began immediately .

= = = Remnants = = =

Due to the significant reclamation on the two sites very little evidence remains of the power stations , other than a small number of bricks and steel rods . Some minor structures have survived to the North West of the North station 's site , including a road bridge over the rail line which served the station , a brick wall , and a concrete staircase . More obvious remains of the power stations are their three large sub @-@ stations that still supply the local region . Much of this electrical power is generated in Scotland 's Cockenzie power station , transported via a 275 kilovolt (kV) and a 400 kV connection .

= = Cultural use = =

The power stations were a strong local landmark . Their chimneys could be seen along a roughly 13 @.@ 8 km (8 @.@ 6 mi) long section of the Tyne valley ; from Bensham near Gateshead down to Heddon @-@ on @-@ the @-@ Wall in Northumberland : almost no other building was present to obstruct the view .

When still in operation , the power stations appeared in films and television programs shot in the Newcastle area . They appeared in Payroll , a movie made in 1961 , starring Michael Craig . One of two security van operators lives in Stella park , a housing estate above the power station . It is

prominently in the background whenever the van operator 's home is shown . In 1985 , the Stella power stations are seen briefly in a shot in Seacoal , a movie made by Amber Films . They appear during a scene where the two protagonists , Ray and Betty , are travelling from Sunderland to Newcastle . (Lynemouth power station , a North East power station still in operation , is more prominent in the film .) In Whatever Happened to the Likely Lads ? , a British sitcom broadcast between 1973 and 1974 , the stations themselves did not appear in the series , but in the end credits their ash boat , Bessie Surtees , could be seen passing Spiller 's Wharf near Byker . In 1981 , it was featured in Swing Bridge Videos ' Check it Out , a short film about youth unemployment in the west end of Newcastle . In the mid @-@ 1990s , the decommissioned stations were photographed by north eastern artist John Kippin as part of his work The Secret Intelligence of the Silent . This piece was exhibited at the Laing Art Gallery in 2012 as part of the exhibition Futureland Now .