

## TILBURY CONTAINER SERVICES GOES FOR BAC TO PROTECT ITS NEW RIVERSIDE BERTH EXTENSION



A new 300 metre long deep water Quay under construction at London's Tilbury Docks, for Tilbury Container Services, is to have its steel piles protected against advanced low water corrosion (ALWC) by a BAC Corrosion Control impressed current cathodic protection (ICCP) system.

BAC has been awarded the contract by AMEC Capital Projects to design, supervise specialist installation activities, test, commission and maintain the cathodic protection (CP) system for one year. The ICCP system uses constant current power supplies energizing ISOMMO mixed metal oxide anodes, which are mounted with cantilever supports on the front face of the piles.

BAC developed ISOMMO anodes as a more cost effective and easier to handle alternative to equivalent silicon iron and magnetite anodes. The tubular device comprises a titanium tube with a mixed metal oxide coating that activates the titanium electrically enabling it to function as an anode. It has a very low consumption rate (micrograms per ampere/year). With the cable connection in the middle of the tube, at a crimped section, even current distribution along the anode's length is assured.

ALWC is a recently discovered phenomenon of bacterially activated corrosion, which is normally concentrated at the low tide level. Historically, corrosion rates at these

levels were thought to be very low but since UK coastal waters are now a lot cleaner, deposits that used to exist on the steel piles have disappeared and the amount of bacteria that is able to live in the water has increased. Corrosion rates from this form of attack can be many times more than the previously accepted norm.

It has been found that if a CP system is installed when the structure is built ALWC does not occur, however for existing structures where CP is not fitted and ALWC is evident BAC Corrosion Control have developed LATreat<sup>®</sup> a 3 stage treatment to arrest the problem.

# Even Better Joints From Our New "Smart" Brazing Units

With a 'smart' digital control system that can tell whether optimum conditions exist for a pin brazing operation, the new BB2 and BB3 units from Bright-Bond, a division of BAC Corrosion Control, perfect connections can be achieved virtually every time. Because the smart controller assesses the set-up conditions, brazing pins are not wasted by being partially brazed before the power cuts out.

Pin brazing was developed over fifty years ago to ensure electrical continuity on rails and connections for all types of track-bound transportation. It is a fully proven technique able to withstand the elements in countries all over the world, from the sub-zero temperatures in arctic Europe and North America to the tropical

humidity in Africa and the Far East.

Both the battery operated BB2 and its bigger sister, the BB3 now have digital control systems instead of analogue, electrical current quality to the brazing head is better resulting in a greatly improved braze. Control is improved and more reliable than the analogue systems. If the software within the control unit detects a problem when an operator begins the brazing sequence, it will stop the process immediately. The pin that is in the gun can be used again as soon as the smart controller has assessed the conditions and indicated what needs resetting to provide optimum conditions.

There are two versions of Bright-Bond BB3. One unit is designed to travel on a rail track, the other has plain

wheels for portability. Both have a large capacity battery and are suitable for all types of installation and maintenance programmes. The pin-brazing process is digitally controlled for consistency of the brazing action and is pre-programmed with three settings, F, B and G that coincides with the type of pin being used. When the correct setting is selected on the control panel, the brazing process is timed to provide an optimum brazed connection every time. The battery capacity is sufficient for approximately 100 brazes with the smallest brazing pin type and is recharged from a mains supply.

By connecting the BB3 to an engine-driven generator unit, the completely sealed batteries can be charged continuously and with this combination the set is suitable for bigger works, typically new construction.

The portable, lightweight BB2 pin-brazing unit is used for smaller maintenance jobs or installations. The equipment functions in a similar manner to the BB3, with a smaller braze capacity of 40 brazes per charge cycle. It is possible however that the batteries can be re-charged during transportation from one site to another using the Bright-Bond in car system.



The "Smart" digital control system on the BB2(Right) and the BB3(left) can tell if optimum brazing conditions exist

BAC CORROSION CONTROL has secured a contract from Foster Wheeler, the appointed EPC contractor for Shell Philippine Exploration BV's onshore gas plant - the last major component of the Shell Malampaya deep water gas-to-power project - to survey, design and supply a corrosion protection system for an extension to the Shell Malampaya onshore gas terminal near Batangas in the Philippines. The system will protect the onshore section of an incoming 24-inch pipeline, the external bases of all site storage tanks, the internals of treatment water tanks and all buried steel surfaces.

All the corrosion protection systems have been designed by BAC to provide a 30-year life and employs over 100

## BAC system for new Philippine onshore gas terminal

BAC Isorod magnesium alloy anodes and over 2 km of zinc ribbon anode. As some of the buried magnesium anodes reach the end of their lives, others will come into operation to provide the long term protection required, hence the high number of anodes. The zinc ribbon anode is spiralled on the exterior bases of the 6 storage tanks.

The Malampaya deep water gas-to-power project represents the largest and most significant industrial investment in the history of the Philippines. It signals the birth of the

country's natural gas industry that will enable a supply of a clean, environmentally friendly source of energy to provide 2,700MW of power for a period of 20 years beginning in January 2002. Currently, the Philippines relies heavily on imported fuel for its domestic and industrial power needs. The upstream component of this US\$5.4 billion government project, being developed by Shell Philippines Exploration BV (SPEX), will reduce the dependence on imported fuel by about 30%.

## 40 YEARS OF PROTECTING POWER PLANT COOLING WATER SYSTEMS

It is now nearly 40 years ago since BAC Corrosion Control, in conjunction with the then named British Atomic Agency developed an anode design that could be used successfully in power plant cooling systems without risk of anode breakage and resultant condenser and line damage. Internal cathodic protection of cooling water lines and condensers is essential due to the quality of water that is usually employed. It is untreated and at the high temperatures that exist in these systems it can be extremely corrosive.



*BAC Eddy Shedding anodes are tubular with a series of holes along their length and have a built-in vibration damping mechanism.*

The flow can be up to 5m/s and as the water passes around the anodes that protrude into the flow, eddy currents are created. These eddys can cause an anode to oscillate and eventually break off completely. A broken anode in the flow can do a great deal of damage, particularly to condensers.

BAC eddy shedding anodes, widely used throughout the world as a standard replacement for solid rod anodes, remove the breakage risk by preventing eddy current build-up. Instead of being solid, the BAC anodes are tubular with a series of eddy shedding holes along their length and have a built-in vibration damping mechanism. They offer much lower resistance to flow and are rated for flow rates up to 5 m/s and pressures up to 5 bar. Eliminating broken anodes reduces downtime and the cost of replacements and substantially lowers on-going service and maintenance costs.

## The BAC Management says.....

*Welcome to this, the first edition of BAC Corrosion Control and Bright-Bond's Newsletter, a publication that we intend to issue twice a year to our many customers, agents and distributors.*

*Our intention is to keep you, our customers, up to date with our latest product launches and to also give a flavour of some of the prestigious projects that we have been working on in the past six months.*

*Thanks to the innovative ideas and hard work from our staff and the continued support from customers old and new, BAC has maintained it's market leading positions in both our core cathodic protection and electrical bonding market segments.*

*We hope that you find this issue and future issues a useful insight into our products and activities and we look forward to continued mutually beneficial business together in the future.*

**Tony Gerrard**  
General Manager

## Accurate Pipe to Soil Potential Readings Easier with New GCU Current Interrupter Series

Recent upgrades to the BAC Corrosion Control GCU series of DC current interrupters now allow more accurate, easy, versatile and economical synchronous switching of cathodic protection stations.

The GCU interrupters are designed to save time during maintenance and survey periods by accurately switching "ON" & "OFF" cathodic protection DC current sources in order that the true polarised pipe to soil potential, used as a criterion for cathodic protective levels, may be recorded on the pipeline. The instant "OFF" potential is considered accurate, as it eliminates an additional voltage drop when the system is switched on and the subsequent volt drop caused by cathodic protection current flow in the soil. The GCU series of current

interrupters are supplied in 3 ratings to cater for most types and capacity of DC power sources: GCU15/R4 15Amp DC capacity (compatible with the GCU/R3 model); GCU25/R1 25Amp DC capacity and GCU100/R1 100Amp DC capacity

The solid state unit uses state of the art electronics housed in a rugged IP65 sealed enclosure built to withstand a wide range of field conditions. Control is through an easy-to-read LCD menu screen which also indicates the condition of the built-in NiMH battery.

Any number of GCU interrupters can be synchronised to pre-determined "ON/OFF" cycles between 0.1 seconds to 6000 seconds. With 50 factory preset ranges and 50 user selectable ranges, any variation of switching cycle can be chosen and saved for future use. The units can be programmed to sleep during non survey hours, such as night time, and then reactivate to continue the survey routine.

With an accuracy 20 mV/seconds a day the units can operate for prolonged periods before any re-synchronisation is necessary. With the display switched off up to 150 hours of switching time is possible before batteries require re-charging.



*The solid state unit is housed in a rugged IP65 sealed enclosure built to withstand a wide range of field conditions.*

# TRENCHLESS PIN-BRAZING FOR BURIED PIPEWORK

## Minimises Disruption in Urban Areas

Latest innovation to come from the BAC Corrosion Control stable is the Easybond Reach System, a technique of making sound retrofit electrical connections to buried pipelines for sacrificial anode attachment anode without resort to a trench to gain access.

The Easybond Reach system comprises a special pin brazing gun with a purpose designed brazing tool that attaches to a fully adjustable — up to 4.0 metres — hollow extension tube made of aluminium for lightness. To reach the buried pipe all that is required is a core-drilled hole, say up to 250mm diameter, down to the pipe where the connection pin needs to be brazed. The system even includes a device for local pipe coating removal and cleaning in the area to be bonded to ensure a good braze. Once the joint



*With the Easybond Reach system all operations are carried out above ground.*

has been made the anodes can be connected and dropped down the core hole prior to back-filling.

Surface disruption is minimised and in urban areas, a few cones around the areas being worked upon is all that is necessary rather than a one-way traffic system allowing trenches to be excavated.

As well as speed and minimal disruption, all operations are carried out above ground, which makes for safe process, as instead of the usual trigger mechanism on the brazing gun, the connection is effected from a switch on the battery unit. It is an all-weather process using an application tool weighing in at approximately 5kg.

## Bright-Bond Puts Connections Back On Track

To ensure electrical continuity on rails for all types of track-bound transportation a system of bonding — pin brazing — was developed over fifty years ago. It is a fully proven technique able to withstand the elements in countries all over the world, from the sub-zero temperatures in arctic Europe and North America to the tropical humidity in Africa and the Far East.

As well as track bonding for signalling purposes the technique is used extensively for the connection of

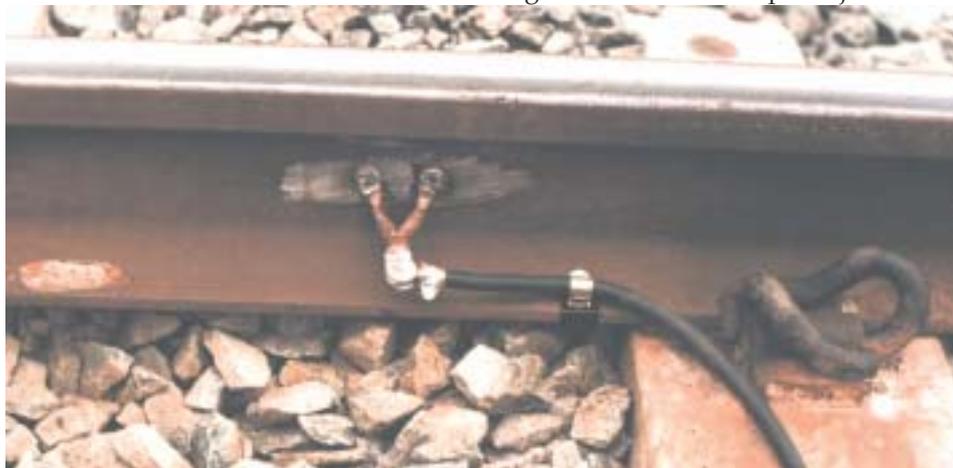
heater strips. Earth connections may also be attached to pylons carrying overhead electricity lines for railway locomotives and tramway systems. Pin brazing has also been a great success in the Cathodic Protection sector, bonding cables to pipelines carrying oil, natural gas and water throughout the world.

In practice, a specially designed brazing pin is inserted into a brazing gun and a ceramic ferrule is placed over it. The gun is applied to a cable lug and after a few simple adjustments

the trigger is depressed. A full bonding operation for brazing two cable lugs takes less than a minute, a saving of nearly twenty minutes per bond when compared to the more conventional methods of track bonding. Tests have shown the bonding to still be intact after more than 5 million wheels have passed over it.

There are two main types of Bright-Bond unit, the popular BB3 with the capacity to produce approximately 150 connections per charge, for long stretches of rails or pylons and the portable BB2 unit, for service and maintenance operations, giving approximately 50 connections per charge. Both units can be tailored manually to suit user's specific needs. A wide range of ancillary equipment is also available including several types of brazing gun, specially designed bonds and cables, batteries and accessories. Bright-Bond units and equipment are available for sale, lease or hire.

The Bright-Bond technique is safe, fast, durable and all weather. Due to its high mechanical strength, Bright-Bond Pin Brazing is an extremely effective and efficient form of electrical bonding.



*As well as track bonding for signalling purposes Bright-Bond is used extensively for heater strip connections*

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