

3C News



**3C BELMET SERVICES CONDUCTS
OEM FIVE-YEAR INSPECTION
OF RISER STRING ONBOARD
DRILLSHIP ENSCO DS-4**

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In over 20 years of operation, 3C Metal has built a strong reputation on our ability to provide a fully-integrated service, offering our clients tailored and cost-effective solutions. By strategically locating our facilities across three continents, we are able to provide a quick response to meet our clients' needs – from engineering to site installation.

3C Metal has kept a strong position in our core business in the oil and gas industry, but in recent years we have actively pursued diversification opportunities in mining, renewable energy and

downstream oil and gas. Between 2015 and 2016, revenue from these diversification activities has doubled – far exceeding the objectives set by senior management. These pleasing results have been made possible by the dedication of all our employees and is testament to our ability to be innovative and adapt to new markets.

Moving forward, it is vital that we continue to push for all entities to work together more closely. This means improving communication, sharing expert knowledge and working strategically at a group level to achieve common goals. By doing so, we aim to ensure the continuous improvement of our productivity across sites and deliver added value to our clients.

As we pass the halfway mark of 2017, I would like to reflect on some of this year's project highlights. In France, 3C Metal successfully completed an 18 month EPC contract for TIGF's RZL project, carrying out pipeline construction, horizontal drilling operations and the construction of four gas interconnection sites. In South Africa, Belmet Marine

has been working to establish a satellite facility in Port Nolloth, for maintaining over 600 offshore containers for De Beers Group Services, through a three-year contract. As featured in our previous newsletter, 3C Metal successfully completed the installation of a managed pressure drilling (MPD) system onboard Seadrill's West Capella drillship in Tenerife, Spain.

3C Metal has also made considerable headway in achieving our main group objective of a safe year without accidents. We closed June with no LTIs and so far 2017 remains LTI-free. Furthermore, we expect to achieve 1.5 million man-hours LTI-free in the third quarter of 2017. This will be a great achievement for the company - one that reflects the passion and commitment to safety shared by all 3C Metal employees.

Please enjoy the read and let us know what you think. Feedback from both clients and employees is always highly appreciated to help us improve our services.

Philippe Boy
Managing Director

A WORD FROM THE GENERAL MANAGER OF 3C METAL SOUTH AFRICA



It has been gratifying to see the continuous development of activities in new markets for 3C Metal South Africa. Our core activities remain in the oil and gas industry, however, challenging market conditions has led to a concerted effort to expand our local workload by exploring new markets. In the past two years there have been few local oil and gas projects and no major Special

Periodic Surveys in any of the South African ports. Local riser and capital drilling equipment inspection and certification work has also reduced.

Notwithstanding this, 3C Metal South Africa has continued to expand our activities. New opportunities for onsite riser inspections and certification work has been generated through our GE Channel partnership agreement. This includes a recent five-year inspection survey of a riser string carried out onboard drillship ENSCO DS-4 in Tenerife, Spain.

3C Metal South Africa has also secured further work in the renewable energy sector. After successfully completing two projects at a biogas plant, we obtained two further projects for prefabrication at two new Concentrated Solar Power (CSP) plants under construction in the Northern Cape - Kathu Solar 1 and Ilanga CSP 1.

Currently underway, these solar projects involve the fabrication of low pressure (LP) loops and header piping and require a large volume of production-line type LP piping spools prefabrication with challenging delivery schedules. These two opportunities have stemmed from the South African Department of Energy's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

As 3C Metal South Africa approaches its 10th anniversary we see these new local markets, together with our existing core oil and gas activities, as the cornerstone for growth and development over the next decade.

Michael Birch
3C Metal South Africa General Manager

3C BELMET SERVICES CONDUCTS OEM FIVE-YEAR INSPECTION OF RISER STRING ONBOARD DRILLSHIP ENSCO DS-4

3C Metal South Africa's specialist division, 3C Belmet Services, recently concluded a GE Oil & Gas Channel Partner five-year inspection survey of the riser string onboard drillship ENSCO DS-4. The inspection survey was carried out in Tenerife, Spain, and was completed within tight time constraints ahead of ENSCO DS-4 moving to Nigeria to commence a drilling campaign.



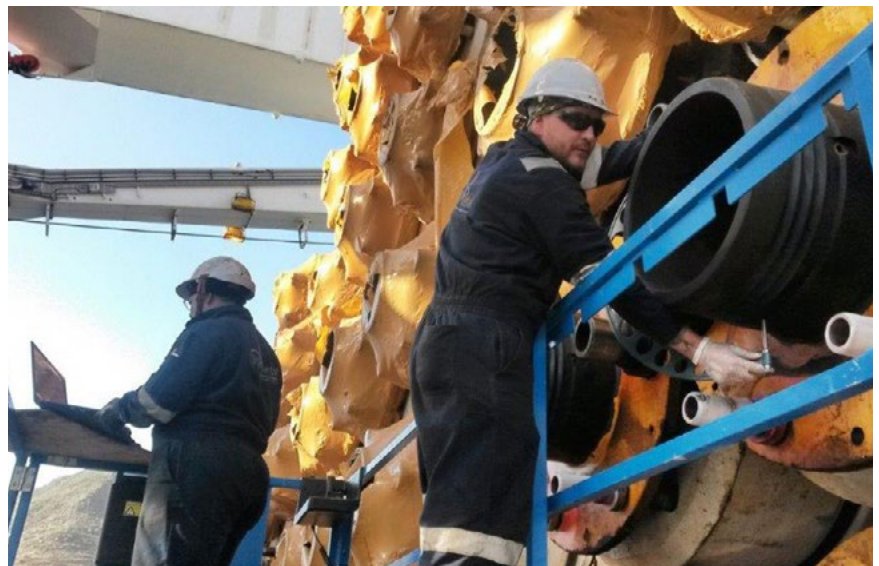
There was a requirement to complete the five-year Original Equipment Manufacturer (OEM) recertification of the GE MR6H-SE style riser string onboard ENSCO DS-4. As a licensed GE Oil & Gas Channel Partner, 3C Belmet Services offered competitive costs and was able to suggest a complete and direct solution to Ensco, carrying out the entire inspection scope onboard the rig within a set timeframe.

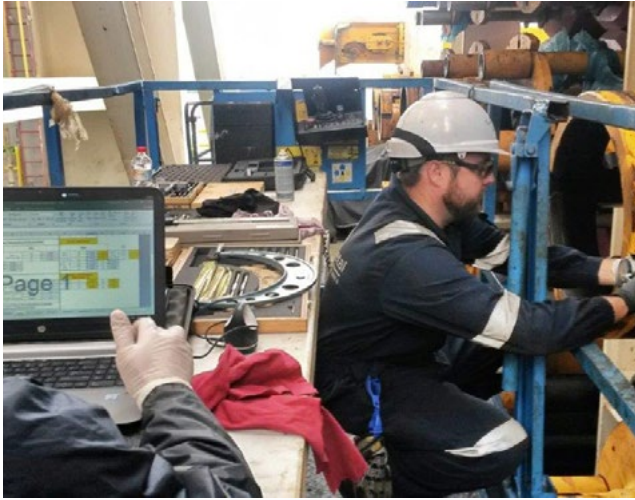
Work began on ENSCO DS-4 with a small team conducting an inspection of riser end connections. This was to identify risers to be processed for the full five-year inspection scope. An intricate plan was developed to swap out a portion of the riser string and rearrange the riser bays.

Having a 3C Belmet Services Project Manager onboard added much value, as they designed and continuously adapted a schedule for processing

risers that integrated seamlessly with Ensco's riser movement plans. The Project Manager controlled the access of the inspection teams to the risers at various times throughout the project.

The challenge was to keep all teams operational without hindering each other and to accommodate the complex riser movements amongst the riser bays.





The crew varied throughout the phases of the project. The mechanical fitting team tackled the disassembly phase, where the intricate end connections of the risers were dismantled to allow inspection. For the cleaning phase, the high-pressure water jet blasting team was brought in to prepare the risers ahead of inspection. Next, automated ultrasonic equipment was passed through the riser tubes to check pipe wall and weld integrity. Visual assessment, surface non-destructive testing and dimensional inspection was then carried out for high-stress areas of the risers and associated parts.

A key part of a riser inspection program is to be able to interpret the inspection data collected and address any non-conforming areas. 3C Belmet Services' engineering team carried out the data analysis and specified repair instructions strictly in accordance with OEM requirements.

Armed with specialist equipment, the experienced inspection team onboard carefully actioned the engineering repair requests to re-instate non-conforming riser equipment. The mechanical fitting team followed up to conclude the re-assembly of the risers in good time to meet the Ensco's expectations.

As always, the 3C Metal personnel maintained a high level of safety on the project whilst working at heights in the riser bays, managing the potential for dropped objects and rigging of heavy parts at heights. A total of 4,477 man-hours were worked with no lost time injuries (LTIs) incurred.

The success of this project highlights the advantage of this cost-effective solution now offered to drilling contractors through the new GE Oil & Gas Channel Partner model.

GENERAL ELECTRIC CHANNEL PARTNERSHIP EXPLAINED

As a GE Oil & Gas Channel Partner for marine drilling risers in the Sub-Saharan Africa region primarily, 3C Belmet Services is approved to serve drilling contractors directly whilst maintaining full OEM certification of equipment at a competitive price point. Under strict regulations, GE recognizes 3C Belmet Services as a valued and established partner in the region offering a cost-effective solution to maintain marine drilling risers. In Europe, GE Oil & Gas services drilling risers directly, although 3C Belmet Services may be used on a case-by-case basis as approved by GE Oil & Gas.

WORK COMMENCES ON TWO SOLAR ENERGY PROJECTS IN SOUTH AFRICA

3C Metal South Africa has made further progress in diversifying operations into renewable energy with the successful award of two new contracts for the development of Concentrated Solar Power (CSP) plants.



The contracts are for low pressure (LP) piping prefabrication for the Kathu and Ilanga 100 megawatt CSP plants being constructed in northwest South Africa. The development of these plants is part of the South African Renewable Energy Independent Power Producer Procurement Program (REIPPPP), implemented by the South African Department of Energy.

Both plants employ parabolic trough technology that uses mirrors to concentrate sunlight onto a receiver - a tube running along the centre of the mirrors that is filled with Heat Transfer Fluid (HTF). The heated fluid is used to turn water into steam, which in turn powers turbines and creates electricity.

3C Metal South Africa are undertaking the prefabrication of two of the HTF piping systems - the loops system for the Kathu plant and the header piping for the Ilanga plant. The HTF loops piping consists of small bore carbon and stainless steel piping that ranges in diameter from one to three inches. In total, 70,000 inches of small bore piping is required with a stringent delivery schedule over a period of approximately four months. The repetitive nature of this fabrication has

required 3C Metal South Africa to establish production lines with customized jigs for the fit-up and welding of the piping spools.

The Ilanga prefabrication contract is for the supply of the header piping that forms the transfer system from the mirror fields to the power plant. The piping is carbon steel with large bore piping up to 28 inches in diameter. The header piping consists of approximately 1900 tons of piping and fittings, 18,500 inches of welding and approximately 14,000m² of coated area. The project duration will be three months.

The projects are running concurrently and are being executed with assistance from Belmet Marine (for the piping fabrication) and 3C Belmet Services (for handling and coating activities). The pipe profile cutting is being done using the new Belmet CNC plasma pipe cutting machine (see page 10 for details).

The new solar piping prefabrication projects are a welcome challenge to the piping fabrication capacity of 3C Metal. The projects also highlight 3C Metal's capability to successfully utilize the facilities of several of its entities in order to increase efficiency and fulfill challenging project requirements.

3C BELMET SERVICES FABRICATES 10 SETS OF AUXILIARY LINES FOR THE BOLETTE DOLPHIN

3C Metal South Africa's specialist division, 3C Belmet Services, recently concluded the fabrication of the complete sets of auxiliary lines for 10 riser joints for the Bolette Dolphin drilling rig.



The full fabrication process was performed by 3C Metal's experienced and specialized capital drilling equipment team, resulting in another successful drilling equipment project. The process involved material handling and preparations, fit-up and welding, post weld heat treatment, pressure testing and final preservation. The project required 3C Metal personnel to work with lines that are rated for 15,000 PSI (choke and kill) and perform hydrostatic pressure testing of these lines at extreme pressures of 22,500 PSI.

As always, the team maintained the highest level of safety and quality. Having an experienced in-house inspection team available to assist during the fabrication process is an added advantage. It reinforces the strict quality policies 3C Metal

employs to ensure the end client receives the highest quality product every time.

The fabrication of these lines was conducted in 3C Metal South Africa's main fabrication facility. The Original Equipment Manufacturer (OEM), as well as Class Authority (DNVGL), monitored the repairs in order to issue a Certificate of Conformance (COC) for the lines once fabrication and hydro testing were completed. Involving the OEM in the repair process adds the technical advantage of ensuring proper conformance to OEM specifications. Additionally, the OEM certification of the riser lines ensures that the auxiliary lines can be used in OEM certified compatible riser strings onboard the client's vessels.



3C METAL STREAMLINES UPGRADES FOR DRILLSHIP ENSCO DS-4

In early 2017, Ensco commissioned 3C Metal to perform upgrades onboard drillship ENSCO DS-4. At the time, ENSCO DS-4 was in Tenerife, Spain, with a short time period in which to prepare for a drilling campaign in Nigeria.



The major upgrades involved the integration of structures, piping and sheave attachment points for various well completion systems. These included the Intervention Workover Control System (IWOCS), the SenTREE Subsea Test Tree (SSTT) system and the Halliburton WellDynamics sheaves from Halliburton and Schlumberger.

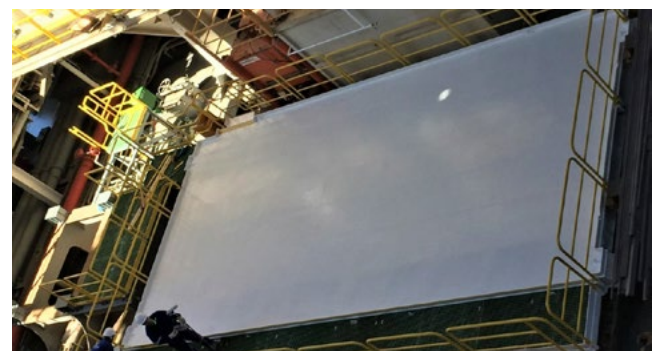
3C Metal delivered two certified DNV 2.7-1 offshore containers holding scaffolding, tools for the installation and most of the structural and piping material. The material was delivered to ENSCO DS-4 in Tenerife, overcoming time constraints by utilizing the various 3C Metal workshop locations in France, South Africa and the UAE.

With concepts and final engineering derived from 3C Metal's 3D laser scanning, the IWOCS and Upper Completions Structures were completed with a combined weight of more than 26 tons. To date, they have taken almost 470 man-days to install. For the WellDynamics spoolers integration, Ensco (and their client, Chevron) requested the six removable and

stackable bridges to be located on the BOP gantry crane structure. Due to the careful and efficient management of a concurrent engineering and prefabrication phase between our engineering office in Dubai and workshop in Cape Town, 35 tons of spooler bridges were completed and delivered to Nigeria before the arrival of ENSCO DS-4.

In addition to the above scopes of work, 3C Metal delivered and installed fully engineered and prefabricated solutions for a high pressure frac line and hose hanger modification, new Jettison skid and the brine system piping, with over 90% of these 400m lines prefabricated in 3C Metal's Cape Town workshop. 3C Metal also carried out modifications to the Mud Logging Unit platform and upgraded the Cutting Dryer System in the Mud Process Room.

With an average of 18 personnel onboard ENSCO DS-4 in Tenerife, over a span of 80 days, 3C Metal has achieved over 17,700 man-hours of installation with no LTIs.



3C METAL ASIA'S ENSCO 67 UPGRADE WORK

3C Metal recently completed upgrade work on jackup rig ENSCO 67 in Johor Port, Malaysia. This project was an ideal opportunity to showcase 3C Metal Asia's support capabilities and facility in Johor.



This challenging project required the replacement and repair of a number of parts, lines and equipment. The project was completed on a quayside in the port with limited facilities. The largest and most complex scope was the integration of an additional accommodation container. A new 8 x POB container was installed on top of the existing accommodation module. The roof was reinforced to withstand the extra weight and the new accommodation was connected to all of the rig's

utilities (water, the sewage system, power, PAGA system, telephone, internet, television and the fire and gas system). Additional work scopes included several high pressure (HP) piping replacements and repairs, and the replacement of the diverter control piping.

All work was completed near the port at the 3C Metal Asia facility in Johor, allowing for a quick and efficient turnover for the project's requirements.

BELMET MARINE FACILITY AT PORT NOLLOTH FULLY OPERATIONAL

The Belmet Marine facility constructed in Port Nolloth, South Africa, is now fully operational. De Beers Group Services are currently managing a supply chain in Port Nolloth and awarded Belmet Marine a contract to oversee the maintenance of over 600 offshore containers.



In late 2016, Belmet Marine commenced work to equip the site with the necessary infrastructure and facilities to carry out a proper maintenance and tracking program. The infrastructure and facilities eliminate long and expensive logistic lines to Cape Town and reduce maintenance and transport costs.

Three sheds have been constructed onsite and are being utilized for the full maintenance cycle, visual inspections, repairs, non-destructive testing, load

testing, blasting and painting. These facilities decrease the cycling time and increase the operational readiness of the offshore containers, reducing costs.

The full maintenance cycle includes: operational fit-for-use inspections; 12-monthly visual inspections as required by the DNV offshore container specification DNV 2.7-1/3; 48-monthly inspections as required by the DNV offshore container specification DNV 2.7-1/3; and unscheduled maintenance repairs due to any mechanical damage

sustained during operation.

The goal moving forward is to process the 600 offshore containers in a safe, quality-orientated, and timely manner. Belmet Marine's operations in Port Nolloth will result in the De Beers Group Services fleet of offshore containers being operationally fit for use, safe, available, and DNV compliant, resulting in improved operations for De Beers Group Services and their client De Beers Marine.

BELMET INVESTS IN NEW MACHINERY TO FURTHER INCREASE PRODUCTION

Belmet recently acquired a new piece of machinery that will streamline production to the benefit of all 3C Metal entities.



The machine is a new-generation MPC (multi-profile cutting) CNC pipe cutting machine. Purchased last year, the machine is now fully-commissioned and is being used on a daily basis. Belmet recently hosted an in-house demonstration for clients to show the machine in action.

The advantages of the CNC pipe cutting machine is that it is versatile,

multipurpose and can be configured to allow the machine to cut pipes and box sections (ranging from 48mm diameter to 610mm diameter piping and 60mm x 60mm SHS to 450mm x 450mm SHS). The advantages it offers has further increased Belmet's workflow efficiencies.

The machine has already been utilized on a multitude of 3C Metal Group

projects including: Belmet's gantry system and sampling tool project for De Beers Marine; 3C Metal Middle East's MPD system integration onboard Seadrill's West Capella drillship; Belmet's subsea crawlers for De Beers Marine; and for piping prefabrication for two of 3C Metal South Africa's renewable energy projects.

3C METAL FRANCE FAREWELLS WORKSHOP FOREMAN



3C Metal France Workshop Foreman, Alain Secail, recently retired after more than 16 years of good and loyal service in the company.

Alain was present during the development of the 3C Metal site in Sauvelade. Boilermaker by trade, his skills made it possible to undertake more and more complex fabrications and projects. Managing Director, Philippe Boy, said Alain’s technical and relationship-building qualities were recognized by all colleagues and management.

Mr Boy said, “Alain is someone the company has always been able to rely on to ensure quality service and on-time delivery to our customers. During his years with us, Alain has made strong friendships with his colleagues and we hope to see him again as often as possible at 3C Metal. We wish Alain an excellent retirement with his wife Yvette, his children and grandchildren.”

3C METAL SOUTH AFRICA ENGINEER RECOGNIZED FOR HIS RESEARCH

The international journal ‘Welding in the World’ recently published a summary of research done by 3C Metal South Africa Welding Engineer, Kristian Kruger. The research, completed for his master’s thesis, explored a specific degradation mechanism in carbon steel.

Mr Kruger said, “The degradation mechanism is called graphitization. It is the accelerated decomposition of the structure (pearlite) in carbon steel and occurs most rapidly close to the weld. Pearlite is what gives carbon steel its strength. Graphitization has in the past lead to critical failures in power stations and petrochemical plants across the world.”

Mr Kruger’s thesis proposed repair techniques that would ensure the safe operation of affected pipelines until the end of (and past) their design life.

In addition to being published, Mr Kruger was awarded his master’s degree from the University of Pretoria with ‘academic honorary colours’ – an accolade given to individuals who have excelled academically and whose research has been deemed as having a high impact in their relevant field.



3C METAL WELCOMES NEW EMPLOYEE

The latest senior and managerial appointments

Eve Berthomier joined 3C Metal in March as the HR and Administration Manager, based in the 3C Metal Middle East office in Dubai. She has 16 years’ experience in the UAE and nine years’ experience in human resources in the oil and gas industry. Her experience includes recruitment, employee relations, learning and development, compensation and benefits.





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