



TM

CHESTERFIELD SPECIAL CYLINDERS

CONTINUING OVER A CENTURY OF INNOVATION IN HIGH PRESSURE CYLINDERS

APV's for motion compensation and diving support

- the backbone of our business



Photo courtesy of National Oilwell Varco

As Chesterfield heads off to exhibit at the Offshore Europe Exhibition in Aberdeen this month, it is perhaps timely to recall that ultra-large air pressure vessels (APVs) for the offshore oil and gas industry continue to be the largest single market for our business.

Our company has been well positioned to offer the specialist manufacturing and design skills necessary to supply these safety-critical components which are manufactured to ISO, DOT or ASME standards. The most frequent applications are as energy buffer storage in motion compensation systems on semi-submersible rigs and drill-ships, or bulk gas storage on DSVs.



Thousands of cylinders have been supplied to constructors for fitting into platforms and ships operating all round the world. The largest of these cylinders can be up to 2,600 litres water capacity and up to 12 metres in length. Working pressures are typically from 300-400 bar - occasionally even higher.

This Newsletter in recent years has often featured additional services which make Chesterfield a one-stop-shop for designers and constructors in the offshore industry:

- MULTI-PACK DESIGN & PRODUCTION • CYLINDER ASSEMBLIES INCLUDING ADAPTORS, VALVES, END BOXES, FRAMING & MANIFOLDING • FITTINGS PROCUREMENT • GAS TRANSPORTATION TRAILERS
- ISO & SWAP-BODY SKID PACKS USED ON DSVs
- A FULL RANGE OF RE-TESTING & RECONDITIONING SERVICES



The package has proved to be very popular but it is fair to say that, without the order for the cylinders, based on their known quality and reliability, the ancillary work would not be forthcoming. Many older APVs and gas cylinders are becoming due for re-testing and replacement. True to form, Chesterfield Special Cylinders is anticipating the need, offering in-situ testing and refurbishment to help prolong their safe operation in service - as outlined in the story alongside.

New orders for new exploration rigs and drill-ships continue to be placed, as even greater depths are scoured for precious oil and gas reserves. Even in world recession, the future for this sector of our business looks promising. So, for once, we trumpet the success of our unsung jumbos.



IN-SITU TESTING OF CYLINDERS

New service capability - we go anywhere !

Chesterfield Special Cylinders has operated a full range of cylinder re-testing and refurbishment services for many years. The in-house facility at Sheffield is approved to test to BS EN 1968 and US DOT 3T, 3AA and 3AAX standards.

This busy operation is fine for renewing and re-validating all cylinders - from small, through industrial sizes up to some ultra-large types. But what if the return of cylinders to such a facility is not feasible?

What can be done when gas cylinders or air pressure vessels are fixed into systems where their removal for re-testing is very difficult or even impossible?



The cylinder owner has an on-going duty of care to ensure the re-validation of high-pressure cylinders, not simply for operational purposes, but in respect of liability to their own staff and third parties who might be affected by their failure. While cylinder maintenance has a cost, particularly disassembly and transportation to a test site, neglect of this process can have even costlier consequences.

The answer to this is testing in-situ without removing cylinders from the site. Chesterfield will be able to offer a full range of testing and re-validation of cylinders anywhere in the world, with full certification supplied as required - regardless of whether Chesterfield was the original manufacturer of the cylinders.

Circumstances where this could be invaluable usually involve ultra-large cylinders. Many industrial-sized cylinders are more easily demountable and transportable. Typical sites with ultra-large cylinders installed include:

- offshore oil and gas rigs
- drill-ships and diving support vessels
- power generation ground storage
- submarines
- warships and commercial surface vessels

'continued overleaf'

'In-situ testing, continued from front page'

Regulations governing cylinder use in such contexts vary enormously in the degree of detail specified in the code. In some areas, it may be unclear which code applies, or who is accredited to assess and provide re-validation when the high pressure system is only part of an even larger platform. None of this absolves the operator from the duty of care.

For example, regular maintenance and safety checks may not be nearly so demanding as those for transportable gas containment systems. Re-validation may sometimes pay scant attention to the cylinders themselves, focusing more generally on the complete pressurised system.

The physical location of cylinders sometimes means that conventional forms of revalidation - particularly hydrostatic testing - could prove problematic. If the removal of moisture is inadequate, it could exacerbate wall thickness corrosion when the pressure system does not incorporate dryers.

The cylinders themselves within the complete system require special attention and care.

None of the in-situ testing methods offered by Chesterfield Special Cylinders will be detrimental to the cylinder under test - namely:

- internal and external visual inspection
- acoustic emission testing
- ultrasonic examination

In-situ refurbishment can include maintenance or replacement of adaptors, valves and fittings; plus the provision of a detailed Pressure Vessel Register of all cylinders on the site or platform. Chesterfield also has specialist knowledge of the problems of hydrogen embrittlement and stress corrosion cracking.



Perfecting the service

Such a service introduction has involved much development of the testing kit and portable refurbishing equipment. Specialist engineering skills and experience are required by the operators who will go on site to carry out the testing programme (see story on reverse of this page). This requires not only a thorough understanding of sophisticated analysis equipment, but also the skills to deploy it effectively on site - often in cramped or even hostile environments.

When cylinders acquire the Chesterfield 'stamp of approval', it ensures an expert and thorough process has been undertaken at a certain time and place. But a proper operational regime must be continued thereafter.

As a cylinder manufacturer with over a hundred years experience, Chesterfield Special Cylinders Ltd can say more justifiably than most -

AT RE-TEST, WHO KNOWS BEST?



A CV which stands the test

Introducing Rob Buckle

'Specialist engineering skills and experience are required' says our introduction to the in-situ testing service overleaf. The description certainly applies to Rob Buckle who joined the company at the end of last year as Acoustic Emission Technical Engineer.

Rob is responsible for the general inspection and non-destructive testing (NDT) of pressure vessels and cylinders, either in house or at various customer sites worldwide. His examination of the cylinders and analysis of test data will reveal their suitability for re-validation and continued service, or it will indicate the need for remedial work, or even withdrawal.

A local man, married with two children, Rob has more than 20 years' experience in engineering, including a recent period with our neighbours Sheffield Forgemasters, where he undertook costing and sales of products to various industrial sectors. But the majority of his career has been in metallurgical and quality control duties, particularly NDT.



In developing his skills, Rob has acquired a whole raft of qualifications in testing and certification techniques, where he holds PCN and SNT Level II in all the main disciplines. Most recently he attained SNT-TC-IA Level I in Acoustic Emission Testing, the exam for which he took in Princeton, New Jersey, USA.

Immediately prior to joining Chesterfield, Rob worked for CAN (Offshore) Ltd as an NDT / Rope Access Technician on inspection and NDT of various pipework, pressure vessels and structures offshore, including magnetic particle and dye penetrant inspection of mechanical features and welds.

This work took place either on deck or via rope access on the Tartan Alpha installation in the North Sea, 125 miles off Aberdeen. So Rob should be used to hanging around in hostile and hazardous environments, not least when supporting Sheffield United Football Club, where he is a season-ticket holder.

A man of many parts - but only one face.



The question has been raised by some of his colleagues: How come Martin Levers seems to get his face on more of our marketing communications material than the rest of the staff put together?

Is it his gaunt good looks? Is it an insatiable appetite for publicity? Is it just serendipity?

Well, none of the above really.



Martin is one of our most experienced, multi-skilled operators who can turn his hand to most tasks on the small cylinder production and the cylinder re-testing and refurbishment sides of our business. It just happened that he was in the right places on the right tasks when photography has been needed at various times. But he wouldn't have been here, there and seemingly everywhere if he couldn't do all the jobs.

These diverse skills have led to Martin being promoted to the staff appointment of Manufacturing Engineer for these same areas.

This role involves working with our team looking at the continuous improvement of our production processes, particularly in terms of 5S practice, throughput efficiency and its beneficial effect on lead and delivery times. Martin's experience made him ideally well placed to understand what is needed to make things run smoothly?

Prior to joining the special cylinder division of the company in 1995, Martin was a mining mechanic - a job which also required versatility. Since then, he has turned his hand to many tasks, adapting as our company has evolved, and staying with it when the move to our present Sheffield site took place.

"I wanted the job," says Martin, "and after asking my work-mates about it, I had no hesitation. To a man they encouraged me to take it."

In a specialist engineering business such as ours, with no production line as such, it is normal for work to ebb and flow across operational areas. Multi-skilling is an essential facet of modern, efficient and competitive production, which benefits both our customers and the company.

So if you are one of our customers for small cylinders or re-testing services, you have probably seen the face. Now you can put a name to the man keeping things moving.