



YOUR INTEGRITY PARTNER

THE EXPERT PROVIDER OF ASSET OPTIMISATION
AND INTEGRITY MANAGEMENT SERVICES TO THE
OIL & GAS, CHEMICAL AND POWER INDUSTRIES.

HOT BOLT CLAMP TECHNOLOGY

STORK

ONE PARTNER FOR LIFE



HOT BOLT CLAMP (HBC) TECHNOLOGY

In direct response to industry safety concerns regarding uncontrolled pressure releases due to severe stud bolt corrosion and failures, we embarked on a rigorous programme to develop the industry-first hot bolt clamp technology.



ACHIEVING THE HIGHEST SAFETY STANDARDS REMAINS THE KEY PRIORITY FOR OPERATORS, HOWEVER, WE ARE INCREASINGLY BEING ASKED TO DEVELOP NEW WAYS TO **IMPROVE THE SAFETY, EFFICIENCY AND COST-EFFECTIVENESS OF OUR OPERATIONS**. THE HOT BOLT CLAMP SYSTEM IS TRULY UNIQUE AND DELIVERS ON ALL THESE FRONTS.



Hot Bolt Clamp Product Manager



We identified a significant cost, time and safety issue for all offshore clients whereby restrictions on the live hot bolting of 4 bolt flanges forced clients to tackle such systems only during specific shutdowns, - a costly and time consuming activity.

Starting from a blank sheet, a bespoke clamping system was conceived and developed over a number of years. Extensive in house testing was followed by discussion with prospective clients for an opportunity to field trial the system.

Since its launch in 2012, our patented and award winning Hot Bolt Clamp technology has revolutionised integrity management of bolted connections, this innovative technology enables the safe removal and replacement of corroded bolts on live flanged connections that have eight bolts or less, with no disruption to production.

The system maintains the integrity of a connection by allowing corroded or damaged studs to be replaced almost immediately. This can be undertaken with the pipeline remaining in service which removes the requirement for shutdowns and the associated downtime, manpower and bed space requirements. Most importantly, the clamp system improves the safety for offshore operatives and the asset as a whole by reducing the likelihood of hydrocarbon releases.

To date, thousands of four bolt flanged connections have been reworked with a 100% success rate, with additional applications scheduled in the near future. We already have an excellent track record and are confident that we will see significant uptake of the technology continue across the UKCS and internationally.

CASE STUDIES

We provide a wide range of integrated management and support services to successfully deliver complex turnaround projects, both onshore and offshore.



Systems initially completed:

- Instrument Air 6 Bar
- Plant Air Estimated 6 Bar
- Pot Water Bar
- Seawater 7 Bar
- Produced Water 7 Bar
- Diesel Transfer and Storage Tanks
- AFFF Foam Storage
- Open / Closed drains
- Sanitary Gray water

In addition to the above initial perceived usage Stork has successfully operated and added the following systems on the Shell Nelson Platform:

- Drill Water
- Aviation Fuel (hydrocarbon)
- Nitrogen
- Completion Fluids
- Chemical Injection
- Hydraulic Oil



SHELL NELSON:

Following on from our initial trip and successful bolt change out of 20 flanges, we were contracted by Shell to operate a 5 month programme whereby, using our HBC System, in excess of 500 four bolt flanges were successfully hot bolted.

The full work scope was completed safely, on time and with zero incidents and within budget.



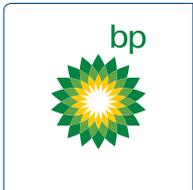
THE HBC TECHNOLOGY IS EXTREMELY USEFUL, AND CERTAINLY MAKES MY JOB A LOT EASIER - TOGETHER WITH A **SIGNIFICANT REDUCTION IN THE AMOUNT OF MAN HOURS AND INPUT FROM OPERATIONS**, AS NO BREAKING OF CONTAINMENT WOULD BE REQUIRED AND VERY LITTLE IN THE WAY OF PLANT WOULD NEED TO BE ISOLATED.



Michael Herdman
Engineering Team Leader - SHELL, NELSON

KEY BENEFITS

BP ANDREW:



Contracted to carry out the four bolt flange replacement bolt programme using our HBC working on line on live systems.

All flanges worked were under live working conditions allowing our HBC team to work on the flanges without the need to de-pressurize and purge any lines, removing the requirement for a costly shutdown.

Results:

- Stork's HBC team replaced the bolts in over 100 flanges in 4 weeks with 100% success rate.
- The full work scope was carried out in time and within the CTR budget.
- Work scope completed safely and on time and with zero incidents.
- Job completion and work pack completion reports given to the client within 7 days of demobilization of the men and equipment.

Alan Love
Mechanical
Engineer
BP, ANDREW



THE STORK TECHNICIANS WERE EXCELLENT, DISPLAYING A SAFE AND CONSCIENTIOUS ATTITUDE TOWARDS THE TASKS THEY WERE ASKED TO CARRY OUT.



COMMITTED TO TECHNICAL INNOVATION:

Specifically designed to allow the hot bolting of four bolt flanges (but not limited to this number). Stork's HBC system provides a safe and controlled method of hot bolting flange joint connections, without the need for a costly shutdown or disruption to the standard line pressure.

Once the flanges are hydraulically clamped together the bolts can be removed and replaced one at a time.

Technical information:

- Maximum working pressure – 689 bar.
- Hand pump operation.

Typical application:

- Working from 150# to 600# rated joints.
- Temperature range up to 90°C.

Works in conjunction with:

- Hydraulic torque tightening.
- Ultrasonic bolt length measurement.



SAFETY IS OUR No.1 PRIORITY

Stork is fully committed to being recognised as a world leader in safety. To help us achieve this goal, we have REACH.

REACH is our global platform for delivering continuous improvement in safety performance. It is the platform on which we will build and communicate our safety culture. It helps us to measure our safety performance, so that we can continue to improve upon it – at all levels.

By placing safety unequivocally as our No.1 priority, REACH helps us to deliver complex projects to the highest HSEQ standards without compromising quality. It provides us with the practical tools and support we need to ensure we get every single employee home safely at the end of each and every shift.

REACH enables us to improve safety performance through:

• MANAGEMENT LEADERSHIP

• EMPOWERING EVERYONE

• IMPROVING PERFORMANCE

• SHARING INFORMATION

• RECOGNISING IMPROVEMENT

• SUSTAINING IMPROVEMENT

In 2011, we were presented with the Safety Leadership Award by Subsea UK and the 'Outstanding HSE' project accolade at the 2011 American Chamber of Commerce of Trinidad & Tobago's Excellence in HSE Awards.

In 2012, we were presented with the Associate Member Award at the IADC North Sea Chapter's annual safety awards. We also won the Oil & Gas Ideas on Safety Prize.

Sharing information is central to REACH. The REACH website is a hub for our campaigns, safety alerts, lessons learned and key performance data.

View this at: www.reachsafety.com

INDUSTRY AWARDS



SPE Offshore Achievement Award 2013

Stork's HBC is shortlisted in the 'Innovator' category of the SPE Offshore Achievement Award 2013.

Recognises excellence in innovative technological solutions developed in the UK for the offshore energy sector.



OCA Challenge Award for Innovation 2012

The Challenge Award for Innovation 2012 honours those who have contributed to business success through innovative practices, products or industry initiatives. Stork was presented with the award by Fergus Ewing MSP, Minister for Energy, Enterprise and Tourism, at the 18th OCA Annual Dinner.



Ideas in Safety Prize' UK Oil and Gas Industry Safety Awards 2012

The award recognises an individual or team working on a UKCS offshore facility that have developed an original idea for improving safety in the workplace focusing on hydrocarbon leak reduction.

Stork's on-site machining & bolting team received the award for its innovative hot bolt clamp system that enables the safe removal and replacement of corroded bolts on live flanged connections that have eight bolts or less.



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