



*A Fluor Company*

# FLANGE INTEGRITY MANAGEMENT



Stork provides integrated machining, bolting & flange management solutions to the Oil & Gas, Subsea, Chemical & Power industries

[WWW.STORK.COM](http://WWW.STORK.COM)



## OUR VALUE DRIVEN APPROACH TO HSEQ

Stork is dedicated to being recognised as an industry leader in HSEQ; by our employees, clients and industry peers. REACH Beyond Zero, our value driven HSEQ engagement programme, will help us to achieve this goal.

REACH Beyond Zero is our HSEQ vision to engage all Stork employees to challenge themselves to think and do more to improve our HSEQ culture and performance. As an organisation we REACH Beyond Zero by functioning as one team with shared values, driving action to transform our HSEQ culture and performance. Safety is our core value and we are committed to translating our HSEQ ethos into sustainable and effective operations. REACH Beyond Zero communicates on Environmental and Quality issues in addition to Health and Safety, ensuring it is fully encompassing employee-led programme.

[www.stork.com/reachbeyondzero](http://www.stork.com/reachbeyondzero)

### WHAT WE DO...

Stork provides the Oil & Gas, Subsea, Chemical and Power Industries with a fully integrated machining, bolting & flange management and support service capable of delivering complex flange management construction and maintenance for shutdown and turnaround (TAR) scopes.

Stork has significant experience in supporting clients, working together to reduce shutdown time through developing integrated plans for shutdown workscopes.

With the full in-house capability to take ownership of the shutdown programme, Stork can also optimise the deployment of competent, multi-disciplined personnel, minimising bed space requirements. In addition, Stork can deliver all activities within a shutdown workscope, including flange face machining, controlled bolting and pipe cutting.

### INTEGRATED SERVICES

As the provider of integrated flange integrity management services, we are committed to developing and introducing technical innovations that help deliver significant safety and efficiency benefits throughout your projects. These services include:

- Machining and bolting
- Corroded Bolt Solutions
- Controlled Bolting
- Pipe cutting
- In-situ machining
- Subsea bolting and machining solutions
- iBolt flange management.

### DELIVERING ON EXPECTATIONS

We pride ourselves on the level of support delivered to all of our clients in the provision of bolting, machining and flange management services and we are keen to maintain our robust delivery track record. Stork has met and often surpassed clients' planned and unplanned requirements over the years, absorbing a number of scopes that competitors were unable to deliver.



**Stork aim to add value wherever we operate and we do this by:**

- Utilising multi-disciplined teams who can deliver a complete flange management service
- Managing potential conflicts between safety, non-routine tasks and high manning levels
- Offering innovative solutions and technologies, for example iBolt
- Providing one focal point to manage all services
- Working in partnership with our clients to efficiently manage the services required.

## INTEGRATED OR STANDALONE SERVICE OFFERING

### MACHINING AND BOLTING

The integrity of bolt and flange connections is key to minimising production downtime. Stork's On-site Machining and Bolting division manages the entire joint integrity process from inspection through to assembly, testing and completion. Our highly experienced multi-disciplined technicians, supported by extensive stocks of specialist equipment, are on hand to provide controlled bolt tightening and on-site machining services worldwide. The requirements set for bolted connections with regard to quality and reliability are substantial.

Developments in bolt materials and gaskets now lead the requirement for reliable pre-calculated tension in bolted connections. The bolt tightening services offered by Stork include:

- Hydraulic bolt torquing
- Hydraulic bolt tensioning
- Induction bolt heating
- Nut splitting
- Joint splitting





Before

After

## CORRODED BOLT SOLUTIONS

Stork provides cost effective and innovative solutions to help our clients with heavily corroded or degraded bolts within flange joints.

Heavily corroded flange bolts leave operators uncertain about the bolts' true integrity. Replacement options can be costly, requiring shutdowns or postponing the decision, leaving corroded bolts in place with a potential for failure. Stork's corroded bolt solutions deliver a third option; providing a means of restoring the flange joint integrity back to its original state in a safe, efficient and cost effective manner.

Stork's corroded bolt solutions enables the safe removal and replacement of corroded bolts on live flanged connections, with no disruption to production. Removal and replacement is achieved with the pipeline remaining in service, eliminating the requirement for shutdowns and the associated downtime. This results in reduced manpower and bed space requirements.

With two types of systems, Hydraulic Clamping System and the Mechanical System, Stork can tailor the correct application to our client's specific problems. Stork's Corroded Bolt Solutions can be used for the following areas of application:

### Integrity

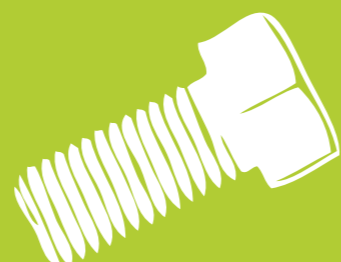
Leave the corroded flange bolts in place and apply the flange integrity system to prevent joint failure.

### Maintenance Hot-Bolting

Temporary application to enable the corroded flange bolts to be replaced via hot bolting

### Intervention

Apply following a loss of joint integrity



## PIPE CUTTING

Stork offers a wide range of portable pneumatic or hydraulically operated machines enabling pipe cutting on almost any size, schedule or material of cylindrical pipe.

Each machine is classified as cold work / spark potential, allowing work to be carried out in zone one areas while backed up with a client exemption certificate. We also provide an extensive selection of ancillary equipment allowing other operations such as match boring, weld preparation and journal turning to be carried out using the same range of machines. Stork utilise highly durable lightweight machines that can be used in any environment. The split frame design of these machines allows minimum set up time and ease of operation. These machines can be driven by either hydraulic or pneumatic motors.

## IN-SITU MACHINING

### Reduced Downtime and Costs

Stork provides a comprehensive range of on-site machining services using in-house mobile equipment. By taking the machine to the work site instead of dismantling and transporting the work piece to the machine, downtimes and associated costs are significantly reduced.

### In-Situ Machining Services include:

- Flange facing to suit ½" to 120" diameter flanges, internally and externally mounted
- RTJ , raised face, O ring grooves etc.
- Milling applications up to 2.2 x 3 m square
- Pipe cutting/Prepping from 1" diameter to 110" and above. Wall thicknesses of up to 4"
- Hot / Cold Tapping from ½" to 12" diameter
- Drilling & Tapping holes up to 6" diameter.

### Special Access Solutions

With use of all the above equipment Stork's Machining & Bolting Rope Access Technicians can carry out all of the above activities in areas that would normally require scaffold or some kind of fixed access platform as in overboard or caisson scenarios.





## IBOLT FLANGE MANAGEMENT

### IBolt Software

iBolt flange integrity management software improves the safety, efficiency and cost effectiveness of bolting operations. The user friendly, web-based system provides a complete auditable record of all activity carried out on flange management worksopes from topside to subsea. The software can be tailored for specific platforms or project requirements. One of Stork's key clients, a major UKCS operator recently requested a bespoke version of the software for use across its North Sea assets.

### IBolt RFID & Barcode

Currently during TAR's and Construction scopes, high volumes of paperwork can be generated in the process of keeping an auditable trail in the Flange Management Process. Many of the challenges encountered are:

- Returning of the 5 part flange tags
- The volume of tags being returned end of shift
- The eligibility of the returned tag
- Blank tags being returned
- Missing tags
- Associating photos to individual joints
- Associating reports to individual joints

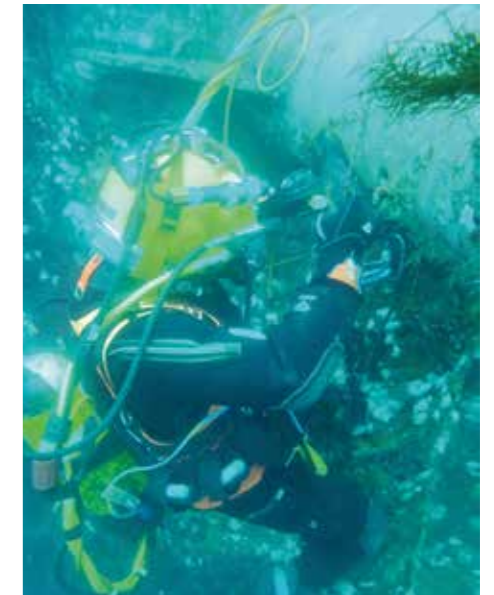
Stork's solution of iBolt, together with RFID and Barcoding can provide an improved and much more manageable flange management process for our clients. The RFID function allows rapid identification of a joint, greatly reducing the risk of misidentification. Stork's RFID & Barcodes provides the following advantages to our clients:

- **Significantly lessen man-hours at a computer preparing and updating the register**
- **Ability to update joint status in real time**
- **Simplifies joint identification**
- **Reduce lead time for daily reporting**
- **Scan RFID tag for instant access to all joint information stored within iBolt's UJR (Universal Joint Register)**
- **The user can various information screens in relation to a joint in-situ through using a tablet based program, meaning all drawings, images, anomaly reports and basic joint information can be viewed before carrying out an activity.**

Stork's full iBolt Flange Management provides our clients with a complete audit trail from start to finish. iBolt enables the handing back of plant and installations to the client with the confidence that every measure has been taken to ensure there will be no major leaks from flanges are involved in the workscope.

## SUBSEA TOOLING RANGE

Stork is a leading provider of subsea integrity solutions, technologies, innovations and specialist services and equipment to the UK subsea industry. With over 30 years' experience and knowledge, our leading subsea integrity solutions and services are tailored to help our clients optimise performance by inspecting, protecting, maintaining, repairing and modifying assets. Our subsea bolt tensioning and hydraulic equipment services offer clients full project management solutions from tool selection, bolt load calculations, the option of hiring associated hydraulic equipment and subsea training courses for divers and deck crews. This approach allows Stork to manage the whole subsea bolt tensioning package, removing multiple interfaces for our clients and providing one focal point for all technical solutions.



Stork is renowned for supplying an extensive range of hydraulic tooling, manufactured from solid stainless steel and maintained and calibrated by a dedicated team of highly skilled technicians, based at our Aberdeen facility. Stork's extensive range of subsea tooling equipment is suitable to support all diver undertaken work scopes. However, it is also used extensively to support rope access or harsh environment operations where safety, speed of execution and quality are required.

### Joint Integrity Tools

- Subsea Tensioners and Split Nuts
- Torque Wrenches
- Subsea Double Acting Nutsplitter
- Flange Spreader
- Flange Alignment
- Flange Pulling System

### Hydraulic Tools

- Hydraulic Pump Unit
- Hydraulic Hose Reel – Twin Umbilical
- Wach Guillotine Saw
- API Class 1-4 Torque Tool
- Subsea Drill Rig: SDR100
- Hydraulic Grinder
- Hydraulic Impact Wrench
- Hydraulic Breaker

## INTEGRATED FLANGE MANAGEMENT SERVICES – DRIVING VALUE

	TRADITIONAL APPROACH	STORK PARTNERSHIP APPROACH
<b>Planning</b>	<ul style="list-style-type: none"> <li>• Client driven</li> <li>• Limited engagement</li> </ul>	<ul style="list-style-type: none"> <li>• Embedded Stork support</li> <li>• Focus on best practice and value driven solutions</li> <li>• Identify pre-shutdown scopes</li> </ul>
<b>Survey</b>	<ul style="list-style-type: none"> <li>• Information gathering</li> <li>• No focus on efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Improved accuracy</li> <li>• Focus on efficiency and effectiveness</li> <li>• Reduced cost</li> </ul>
<b>Cost</b>	<ul style="list-style-type: none"> <li>• Costs designed in</li> <li>• Cost reduction be attacking margins</li> </ul>	<ul style="list-style-type: none"> <li>• Focus on value</li> <li>• Increased accuracy</li> <li>• Reduced cost</li> </ul>
<b>Execution</b>	<ul style="list-style-type: none"> <li>• Individual teams</li> <li>• Multiple contact points</li> <li>• Increased downtime</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated teams</li> <li>• Improved safety</li> <li>• Less downtime</li> <li>• Improved quality</li> </ul>

**STORK**

Norfolk House  
Pitmedden Road  
Dyce  
Aberdeen  
AB21 0DP

Contact us:

+44 (0)1224 722888

[Info.Aberdeen@stork.com](mailto:Info.Aberdeen@stork.com)

**[WWW.STORK.COM](http://WWW.STORK.COM)**

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