

(一) 法兰螺栓热态更换技术 (运行状态下): STORK创新专利技术

INDUSTRY-FIRST HOT BOLT CLAMP TECHNOLOGY 业内第一的热螺栓夹具技术 - 获多项业内大奖

Client challenge: Corroding flange bolts can pose a serious safety, production and environmental risk and therefore have to be replaced. Traditionally the whole line would have to be taken out of commission, purged and depressurized before the corroded bolts can safely be replaced. This adds unnecessary complexity and potentially extends turnaround durations.

Solution: By replicating the clamping forces induced by the existing bolts in a controlled way, bolts can be replaced without having to take the system out of operation.

Client benefit: Corroded bolts can be safely replaced whenever required, without having to precariously wait for a shutdown. By taking it out of the turnaround scope, TARs can be shortened, allowing increased production.

Proof: Stork's application of the Hot Bolt Camp has a 100% safe record on over 3000 flanges worldwide. Sometimes whole campaigns are held (> 550 flanges), while in other cases just hot bolting a much smaller number can already help avoid plant shutdown.

客户的挑战: 腐蚀的法兰螺栓会对安全、生产和环境造成风险，因此必须更换。传统的方法是在腐蚀的螺栓更换之前，停止整个生产线、清洁和降压处理，这增加了不必要的复杂性，延长了生产检修的时间。

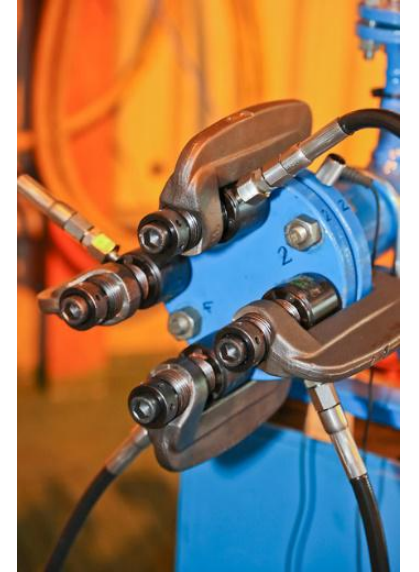
解决方案: 通过一个可控的装置，重新匹配现有螺栓引起的卡紧力，不需要停下系统，就可以更换螺栓。

(这些之所以可以实现是因为复制现有的螺栓夹力，使其在无需对垫圈施加外力的情况下被更换。一旦法兰被液压夹紧在一起，螺栓就可以拆卸并一次更换一个。最重要的是，通过降低油气泄漏的风险，热夹具系统提高了作业人员和资产的整体安全性)

客户受益: 在任何时候都可以对腐蚀的螺栓进行更换，而不需要危险地等候停机。缩短TARs的时间，增加生产量。

业绩: 在全世界范围内，施托克拥有3000套法兰热态更换的100%安全记录，有时一个项目整个工作量甚至超过550套法兰。而在其他实例中，仅进行少量热态螺栓更换就能帮助工厂免于事故停机。

用户包括: 壳牌, BP, 雪弗龙, 道达尔等。





壳牌公司应用及评价

法兰螺栓热态更换技术



Since its launch, Stork's patented and multi-award winning HBC system has revolutionised integrity management of bolted connections. 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.

The system replicates the clamping forces induced by the existing bolts, enabling the replacement of bolts without exerting additional forces to the gaskets.

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

Improving Safety and Productivity

All hydraulic HBCs are fitted with a secondary safety mechanism in a mechanical lock, ensuring that if there is a plant air failure on the asset the clamps are mechanically locked in place. Not only does the HBC technology reduce risk and help assure integrity - it also improves the safety environment on an asset, simultaneously reducing operating costs and optimising productivity. The removal and replacement of the corroded bolts is achieved with the pipeline remaining in service, critical lines can stay live with no production loss, on average turnaround scopes can be reduced by an average of three days.

To date, thousands of four bolt flanged connections have been reworked with a 100% success rate, additional applications are scheduled in the near future. As part of the HBC offering, Stork deliver a full survey prior to work commencement ensuring worksopes are agreed with the client. This includes:

- Surveyor liaises with the client to locate flanges, with uniquely numbered tags fitted on each flange to be reworked.
- Each flange is photographed and notes made on accessibility (scaffold etc) and suitability of the flanges for the hot bolting kit. Dummy clamps are trial fitted and the replacement bolt length is noted to allow compilation of a replacement bolt list.
- A Survey Form is completed for each individual flange. Each Survey Form is assessed by a Stork Engineer and comments added to the Assessment Report. This workscope is then compiled and submitted to the client with the full survey report.
- Highly competent and skilled technicians are then mobilised with equipment at the clients instruction. Daily progress reports are logged on a Flange Tracker to give the client visibility of progress and identify any flanges which cannot be completed, giving full justifications as to why. A final report, including all completion reports is then issued to the client.

CASE STUDIES

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



Project information

- Maximum working pressure – 689 bar
- Hand pump operation

Typical application:

- 4 bolt flanges
- Working from 150 # to 600 # rated joints
- Temperature range up to 71°C

Works in conjunction with:

- Controlled torque tightening
- Ultrasonic bolt length measurement

Results & benefits:

- Following on from the initial trip and successful bolt change out of 20 flanges, we went on to

Workscope

Stork was contracted to carry out four bolt flange replacement on the Shell Nelson. A pre-job survey was recommended and agreed with the client allowing all work to be planned efficiently and in line with ongoing work scopes.

All flanges worked were under live working conditions allowing the HBC team to work on the flanges without the need to depressurize and purge any lines, removing the requirement for a costly shutdown. operate a 5 month programme whereby, using the Stork HBC system, in excess of 500 four bolt flanges were successfully hot bolted

- 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 demobilisation of the men and equipment.

用户评价:



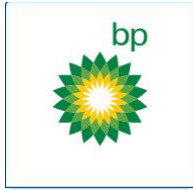
THE HBC TECHNOLOGY IS EXTREMELY USEFUL, AND CERTAINLY MAKES MY JOB A LOT EASIER - TOGETHER WITH A **SIGNIFICANT REDUCTION IN THE AMOUNT OF MAN HOURS AND INPUT FROM OPERATIONS**, AS NO BREAKING OF CONTAINMENT WOULD BE REQUIRED AND VERY LITTLE IN THE WAY OF PLANT WOULD NEED TO BE ISOLATED.



Michael Herdman
Engineering Team Leader - SHELL, NELSON

BP公司应用及评价

法兰螺栓热态更换技术



Workscope

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

Utilising Stork's Hot Bolt Clamp and implementing fittings of the correct grade, full mechanical integrity was restored to the asset without the need to shut down the system and purge it, removing the requirement for a costly shutdown.

Quality communication and meticulous planning ensured that the project was delivered with no time lost incidents and within the tight work schedule during hazardous weather conditions.

Results & benefits:

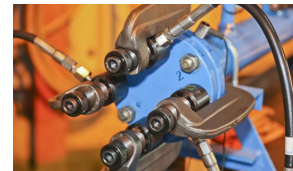
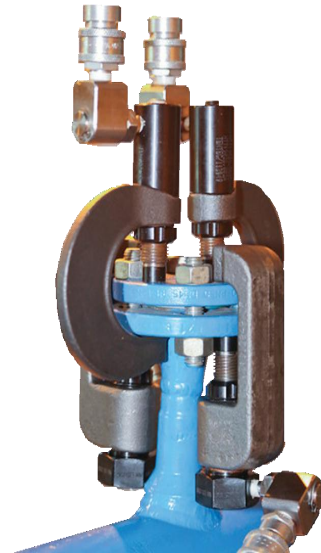
- Stork's HBC team replaced the bolts in over 100 flanges in 4 weeks with 100% success rate.
- The full work scope was carried out in time and within the CTR budget.
- Work scope completed safely and on time and with zero incidents.



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



Alan Love
Mechanical Engineer - BP, ANDREW



COMMITTED TO TECHNICAL INNOVATION:技术创新

The clamps have been specifically designed to allow the hot bolting of four bolt flanges (but is not limited to this number). Hot bolting of any flange below eight bolt flanges is not yet recognised within the engineering industry.

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 corroded or damaged bolts can be removed and replaced one at a time, with the system maintains the integrity of a connection.

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

Workscope

Stork was contracted by BP Skarv FPSO to address issues regarding 1.5" class 300 flanges on a flare system. **火炬系统的300个法兰**

Solution

Recognising the clients' needs, Stork mobilised Stork's Hot Bolt Clamp and fully trained personnel within 24 hours, allowing for full integrity to be restored through the on-line replacement of existing bolts without a break of containment or loss of production. Utilising Stork's patented technology, the operator avoided costly shutdown expenditure.

Further flanges with similar issues were identified by Stork personnel; however, due to the varying sizes, a second Stork Hot Bolt Clamp operative was mobilised along with additional clamps to suit the extended workscopes.

Results

Utilising Stork's Hot Bolt Clamp and implementing fittings of the correct grade, full mechanical integrity was restored to the asset without the need to shut down the system and purge it.

Quality communication and meticulous planning ensured that the project was delivered with no time lost incidents and within the tight work schedule during hazardous weather conditions.

用户评价:

"Stork completed their hot-bolting work safely and documented the work thoroughly. As the scope of work grew, they were very flexible and provided additional people and tooling quickly. The use of hot-bolting eliminated the need to gas-free the flare header and hence saved a lot of time and production. Overall, we were happy with the service provided and would use the company again."

Tomas Flanagan
Skarv TAR Lead
BP Norway



Project information:

When: 2013

Location:

- BP Skarv FPSO
- North Sea, Norwegian Sector

Resources:

- Hot Bolt Clamp

Challenge:

- Time critical nature of the project resulted in the fast, efficient mobilisation of resources
- Working in extreme weather conditions

Safety:

- Project delivered with no lost time incidents

Workscope completion:

- The workscope was completed on time and on budget