

(二) 智能化法兰管理软件 I-BOLT - STORK创新技术



iBolt is a web based system, providing remote access to Stork or client personnel, displaying real time data on the current system and asset status allowing 24/7 access, reducing the lead time for daily reporting.

iBolt是一个基于网络系统，提供对施托克或客户端人员的远程访问，显示当前系统和资产状态的实时数据，允许24/7的访问，减少了每日报告的交付时间。

Features include but are not limited to:
功能包括但不限于:

- ✓ Mobile application 移动应用程序
- ✓ Universal joint register recording all asset joints
通用接合点登记簿记录所有资产接合点
- ✓ Real time activity updated in-situ 实时活动现场更新
- ✓ Real time flange status through online portal
通过在线门户实时更新法兰状态
- ✓ Complete audit trail from start to finish
完成从开始到结束的审计跟踪
- ✓ Online marked up drawing storage facility 在线标记图纸存储设施
- ✓ Report generation and historical data 报告生成和历史数据
- ✓ Online torque/tension calculator 在线扭矩/张力计算器
- ✓ Electronic mark up of drawings P & ID's & ISO's 图纸、管道安装图和国际标准组织的电子标记
- ✓ Leak test certification storage facility 泄漏测试认证存储设施
- ✓ System handover certificate leak test reports 系统移交证书泄漏测试报告
- ✓ Tablet & scanner hardware for real time update 平板电脑和扫描仪硬件实时更新



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.

Mariner A & B 挪威石油公司项目的应用:

Provided Statoil UK with a full flange management software / hardware system, Stork iBolt. Software database provides users with flange status, annotated P&ID's & client specific bolt load data whilst retaining all flange activity history. The hardware utilized on the RFID & Barcode systems are Zone 1 rated running an android based flange management application, this technology used in the field greatly reduces the requirement for manual data inputting and provides real time flange status. P&ID's, marked up drawings, photos and bolt load data can all be viewed on the zone 1 rated tablet.

为挪威国家石油公司提供了完整的法兰管理软件/硬件系统，Stork iBolt。软件数据库为用户提供法兰状态，标注P&ID和客户特定的螺栓负载数据，同时保留所有法兰使用历史。RFID和条形码系统使用的硬件为区域1级，运行基于安卓的法兰管理应用程序，该技术应用于该领域大大降低了手工输入数据的要求，并提供实时的法兰状态。P&ID，标记的图纸，照片和螺栓负载数据都可以在1区额定平板电脑上查看。

STORK INNOVATION FLANGE MANAGEMENT 法兰管理软件 IBOLT

Client challenge: While nearly all the attention goes to ‘mission critical’ equipment such as reactors, heat exchangers and rotating equipment, failure of one of the thousands of flanges that keep a facility together, can also result in the facility going down.

Solution: Stork has developed an on-line flange management database that allows all works undertaken on bolted connections to be tracked, including inspection results and when was it tightened with which force by which tool, with which grease and by who.

Client benefit: Enhances efficiency: streamlined work process, incl. bolt load calculation, tool selection guidance, RFID & barcode enabled flange identification & real-time reporting app

- Enables compliance: provides an auditable trail of all aspects of connection work, allowing HSE requirements to be met
- Allows predictive flange management: if there is an issue with a certain bolt, we know where similar bolts are located
- Web based access allows remote viewing of progress / data

Proof: Numerous Clients have benefited from iBolt and associated work processes, allowing their facilities to become leak-free.

客户的挑战：当几乎所有注意力放在“任务关键”的设备上时，如反应器，换热器和旋转设备，在工厂的几千个法兰中有一个出现故障，也能够导致工厂停机。

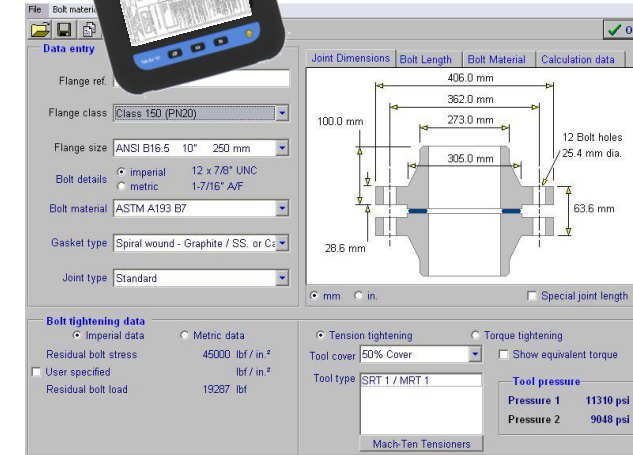
方案：施托克**开发出在线法兰管理数据库**，允许对所有螺栓连接的工作进行追踪，包括检测结果，何时紧固的，用了多大的力，用的是何种工具，由谁，使用的是哪种润滑脂。

客户受益：

- 提高效率，流水线工作处理，包括螺栓载荷计算，工具选用指导，RFID&条码法兰识别，实时报告小程序
- 能够保证一致性：提供所有连接方面的统计轨迹，满足HSE的要求
- 允许预测法兰管理：如果某个螺栓有问题，我们就知道相似螺栓的位置。
- 基于网络访问，可以远程观看过程/数据。

业绩：

大量的客户从Ibolt程序和相关的工作处理中受益，可以让他们的工厂无泄漏。



I-BOLT 4.0版本

Stork iBolt has the function to fully annotate P&ID's, ISO's with text, shapes and colours.

施托克iBolt具有完全注释管道安装图和国际标准组织的文本、形状和颜色的功能。

When assigning a joint to a drawing, the unique tag number will be included.

当将一个节点分配给一个绘图时，标记号将是唯一的。

Witness and isolation joints are also identified with additional markings to ensure they stand out from a standard joint.

共同见证和隔离接缝也有额外的标志，以确保他们区别于标准连接。

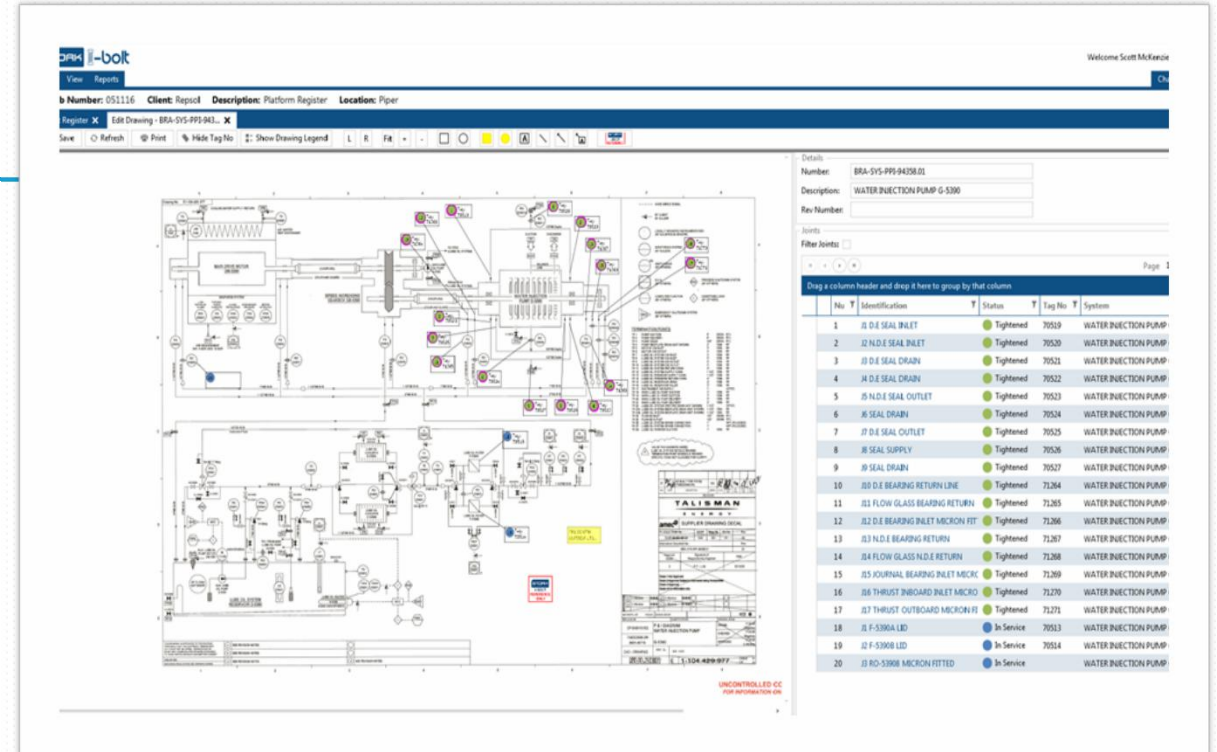
The latest V4 software utilises asset specific piping classes as the driver to obtain bolt loads, bolt grade & length, gasket type, etc., this results in a simplified joint register which is only inputted once.

最新的V4软件使用资产特定的管道类别作为驱动程序来获得螺栓负载、螺栓等级和螺栓长度、垫片类型等，因此演变成了一个简化的只需输入一次的接合点寄存器。

This version is aimed at assets utilising the flange management for maintenance and day to day tracking of flange breaks, PSV recertification etc.. Training can be Carried out at Stork's dedicated Training Facility or in-situ to avoid disruption of field break.

该版本针对使用法兰管理进行维护和法兰断裂的日常跟踪、PSV重新认证等的资产。可以在施托克专用的训练设施进行训练，也可以在现场进行训练，以避免场地中断。

iBolt的第4版带来的主要附加功能之一是RFID扫描仪的使用，它允许实时更新。iBolt捕获每个节点的历史记录，版本4允许立即创建新寄存器。



The screenshot displays the iBolt software interface. At the top, there is a header with the iBolt logo and user information: "Welcome Scott McKenzie". Below the header, there is a navigation bar with options like "View", "Reports", and "Register". The main area is divided into two sections. On the left, there is a large P&ID drawing with various piping and equipment symbols. On the right, there is a "Details" panel for a specific joint, showing fields for "Number", "Description", and "Rev Number". Below the details panel is a "Joints" table with a search filter and a table of joint data.

No	Y	Identification	Status	Y	Tag No	Y	System
1		0 D.E SEAL INLET	Tightened		70519		WATER INJECTION PUMP
2		02 N.D.E SEAL INLET	Tightened		70520		WATER INJECTION PUMP
3		0 D.E SEAL DRAIN	Tightened		70521		WATER INJECTION PUMP
4		0 D.E SEAL DRAIN	Tightened		70522		WATER INJECTION PUMP
5		0 N.D.E SEAL OUTLET	Tightened		70523		WATER INJECTION PUMP
6		0 SEAL DRAIN	Tightened		70524		WATER INJECTION PUMP
7		0 D.E SEAL OUTLET	Tightened		70525		WATER INJECTION PUMP
8		0 SEAL SUPPLY	Tightened		70526		WATER INJECTION PUMP
9		0 SEAL DRAIN	Tightened		70527		WATER INJECTION PUMP
10		00 D.E BEARING RETURN LINE	Tightened		71264		WATER INJECTION PUMP
11		00 FLOW GLASS BEARING RETURN	Tightened		71265		WATER INJECTION PUMP
12		00 D.E BEARING PALET MICRON FIT	Tightened		71266		WATER INJECTION PUMP
13		00 FLOW GLASS BEARING RETURN	Tightened		71267		WATER INJECTION PUMP
14		00 FLOW GLASS N.D.E RETURN	Tightened		71268		WATER INJECTION PUMP
15		00 JOURNAL BEARING INLET MICKI	Tightened		71269		WATER INJECTION PUMP
16		00 THRUST INBOARD INLET MICKI	Tightened		71270		WATER INJECTION PUMP
17		00 THRUST OUTBOARD MICRON FI	Tightened		71271		WATER INJECTION PUMP
18		0 F-5306 LID	In Service		70513		WATER INJECTION PUMP
19		0 F-5308 LID	In Service		70514		WATER INJECTION PUMP
20		0 RO-5308 MICRON FITTED	In Service		70514		WATER INJECTION PUMP

STORK'S INNOVATIVE SOLUTIONS:

RFID 施托克创新技术： 无线射频 + 条形码应用程序， 并与iBolt一起运行

Stork has developed an RFID application on an Android platform to run with iBolt. This negates the need to manually transcribe the joint information when creating a project work scope register. It also brings the following benefits:

Stork在一个安卓平台上开发了一个RFID应用程序， 并与iBolt一起运行。这就消除了
在创建项目工作范围寄存器时手动转录关联信息的需要。它也带来以下益处：

- Rapid identification of joints by scanning the RFID tag
通过扫描RFID标签快速识别关节
- Elimination of double entry since test results are captured directly on the tablet/scanner
消除二次测试， 因为结果可以直接显示在平板电脑或扫描设备上

Stork can manually check and update iBolt with the joint status using the physical tear off section of the 5 part tag. The in-situ technician can also scan a barcode on the tear-off tag which will automatically update the status in the register in real-time.

Our iBolt system allows the Flange Break register Supervisor to record the individual technician and company they work for against each activity stage. On roll out of the barcode tag scanning enhancement, the technician logged onto the tablet/scanner will be assigned against that activity stage.

Stork 可以在 iBolt上手动检查和更新连接状态， 通过手动可拆卸的5个标签。现场技术人员还可以通过扫描拆封标签上的条形码， 条形码会实时自动更新登记册上的状态

我们的iBolt系统允许可断法兰登记主管记录每个活动阶段的技术人员和他们所在的公司。当条形码标签扫描完成后， 登录到平板电脑/扫描仪的技术人员将被分配到该活动阶段。



Stork's iBolt system and RFID approach provides demonstrable benefits in the rapid identification of joints by scanning the RFID tag, elimination of double entry since test results are captured directly on the tablet/scanner, resulting in an efficient work scope being executed across assets.

Stork的iBolt系统和RFID方法在通过扫描RFID标签快速识别连接方面提供了显而易见的好处， 消除了重复输入， 因为测试结果可以直接在平板电脑/扫描仪上获取， 从而产生可跨资产执行的高效工作模式。



法兰管理软件应用案例 Flange Management Software



Workscope

Stork have been contracted by various Operators for On-Site Machining & Bolting services on their North Sea UKS assets. The amount of data a client is required to retain to comply with HSE legislation for flanged and screwed connections, similar to a welded joint, can become vast and complicated and considering this joint can be broken and assembled many times, this only adds to the “data overload” situation that the Client is feeling.

An alternative approach to flange data management over the current ‘spreadsheet’ process was offered which could provide a fully auditable record of disturbed joints during high activity periods.

Solution

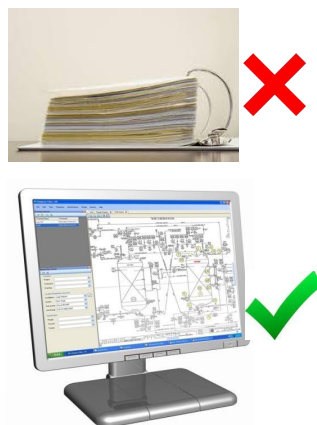
Stork contracted an established engineering software developer to build a flange management program which was easy to navigate and maintain. Relying on our in house experience and past projects, we developed a software package which addressed and exceeded the client requirements and expectations.

After extensive trials both offshore and onshore with the program, Stork went ‘live’ with the software in Jan 2012, with great results. The system is continuously enhanced and the latest V4 now incorporates barcode tag reading and zone 1 hardware tablets.

Results & benefits

The program allows a fully auditable record of all joints disturbed, and can be used by the Operator maintenance technicians for day to day activities. The easy to use web based software improves the safety, efficiency and cost-effectiveness of bolting operations:

- Enhances efficiency during a high activity scopes.
- Enables compliance. Provides an auditable trail of all aspects of connection work, allowing HSE and certification requirements to be met
- Web based access allows real time remote viewing of progress
- Allows historical & predictive flange management.
- The goal is a leak free facility over time.



Project information

When: 2012 to present

Location : Various UKCS assets & International

Workscope: iBolt Flange Management Data Software

Challenge

- To reduce the amount of ‘hard’ data required in the flange management process
- To provide a fully auditable record of disturbed joints
- To record who is responsible for each stage of the flange break process

Benefit

- A major reduction in hard copy paperwork
- A major reduction in manual data inputting
- A fully auditable record which exceeds HSE requirements
- Annotation of P&ID’s
- Significant cost savings with a more efficient process