CAISSON MANAGEMENT SOLUTIONS

Your single interface for effective Caisson Management solutions.

WWW.STORK.COM
**WE ARE YOUR SINGLE INTERFACE**

Caissons are essential to an asset’s operations and can be problematic due to stress, fatigue, increased corrosion, failure through cracking and through wall defects. This can result in costly shutdowns or high risk dropped-object issues.

With the introduction of Stork’s unique swaging technology, we deliver a complete Caisson Management package: Assess, Inspect & Repair (A.I.R.). As the ageing process of assets continues to deteriorate caisson condition, Stork can offer a full service to support the re-instatement of structural integrity to caissons.

**COMPLETE CAISSON MANAGEMENT**

Stork has a strong track record of over 20 years’ in providing Caisson Management solutions, including risers and j-tubes, fully tailored to our clients’ requirements.

Our portfolio ensures caissons are fit-for continued service whilst providing asset owners with confidence in their caisson integrity status. As part of this service, Stork provides an effective A.I.R. programme ensuring reliability, technical integrity, safety and regulatory compliance is delivered.

**ASSESS, INSPECT & REPAIR: THE A.I.R. APPROACH**

**ASSESS**
We perform our data-driven integrity assessments, prioritisation and planning package:
- Assess caissons’ history and define what, when and where needs inspected.
- Prioritisation defined.
- Planning for implementation and repair recommendations.

**INSPECT**
Through Stork’s in-house Specialist Inspection division we deliver:
- An initial camera inspection.
- High pressure cleaning.
- Additional camera survey.
- Ultrasonic testing measurements.
- Full report with video footage is also supplied to client.

**REPAIR**
We restore a caisson’s full integrity during our repair phase:
- Upon review of Inspection’s UT Report, a Technical/Review/Note with recommendations suggested by our in-house Corrosion and Structural Engineers is made.
- If a swage repair process is required, Stork also supplies internal liner material, connectors and associated components.
- Provision of a stand-alone, integrated team inclusive of in-house riggers and welders.
- Identified repair process carried out.
- A dedicated multi-disciplined team, all working under an experienced Project Management team will be deployed.

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Stork's Specialist Inspection division are an established and technology driven team with a rich heritage of delivering safe, efficient and innovative inspection solutions. With over 20 years' industry experience, Stork provides clients with accurate, clear and valuable data on caisson, riser and j-tube inspections. This is in addition to our advanced and conventional Non-Destructive Testing (NDT) methods and innovations; such as internal laser profiling. All of Stork's Specialist Inspection tooling has been designed with maximising efficiencies for our clients at the forefront of our minds. Our newly developed Caisson Inspection Tool boasts the following benefits:

**Motorsied centralising**: With the centralising being motorised, this allows for better deployment past restrictions found within some caissons (liners for example). Being electrical rather than hydraulic also reduces the manual handling requirements, as well as negating the need for more umbilicals having to be deployed. This compared to being hydraulically powered, allows the operator total control of the tool from the offshore laptop.

**Scan length**: The new tool can scan 500mm in axial length, reducing scanning time; as it covers twice the length of previous versions.

**Twin probes**: Stork's system is comprised of two UT (Ultrasonic Testing) probes. This lessens the scanning required to half the rotational amount, improving scan time efficiency, while still retaining total coverage of the item being inspected. The probes have a 180° offset therefore only a 180° sweep is required to capture the full 360° of wall thickness data.

**Backwards scanning**: Stork's state-of-the-art equipment also scans backwards. This makes it more efficient to negate the time taken to retract the axial per scan, rather than having to wait for it to retract after finishing every scan; again improving scan time efficiency.

**Motorised probe arms**: The motorised probe arm enables modifications of the ID ranges, meaning the tool is capable of scanning whilst in-situ. This eliminates the requirement to recover the tool to make adjustments; again reducing setup time and increasing efficiencies on the job, whilst ensuring both probes have the same stand-off distance as each other, from the internal surface of the inspection item.

**SWAGE REPAIRS**

In the past, the supply chain arena has been limited with regards to caisson repairs, however Stork has brought an integrated, state-of-the-art solution to the marketplace. Through significant research, investment and resources, Stork has developed and deployed swage repair tooling. The technology and associated Finite Element Analysis (FEA) are DNV-GL accredited, further demonstrating our proven repair solution.

- **Innovation**
  - Improved swage technology.
  - Cost reduction for required liners.

- **Assurance**
  - Independently assessed.
  - Risk Based Inspection planning and implementation.

- **Features**
  - Improved efficiency of swage i.e. can effectively swage a range of caisson thicknesses without the need to vary liner section thickness and grade.
  - Pressure-driven, retractable centralisers to ensure the tool is fully concentric with the liner throughout the swaging operation.
  - Both digital and manual monitoring and tracking of pressure/volume during swaging operation ensuring full control of the swage quality.

- **Safety**
  - Fully function and load tested.
  - Robust HSE culture embedded throughout operations.

- **Knowledge**
  - Front-end engineering FEA has been successfully performed and was based on common North Sea caisson sizes, from a range of 20” - 36”.

- **Benefits**
  - Fast and effective repair method.
  - Multi-disciplined team, reducing personnel on board, whilst delivering to the highest quality standard.
  - Availability of tool for the work scope can be controlled in-house.
  - Full connection strength of each swage repair will be proven by manual and FEA calculations on a case by case basis.
  - Competitive, low cost solution.
  - Strong HSEQ culture implemented throughout operations, ensuring safe working practices are adhered to.
  - Environmentally friendly and pollution free.

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REACH BEYOND ZERO

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. REACH Beyond Zero is built on five core values, which we seek to demonstrate at every level of our organisation.

The values are:

- **VISIBILITY** - acting as active champions of the REACH Beyond Zero values
- **AUTHENTICITY** - demonstrating personal commitment through action
- **LEADERSHIP** - taking personal ownership and responsibility for HSEQ in the workplace
- **UNDERSTANDING** - understanding our HSEQ challenges and contributing to improvements
- **ENGAGEMENT** - feeling empowered to intervene when a situation appears unsafe

Visit [www.stork.com/REACHBeyondZero](http://www.stork.com/REACHBeyondZero) for more information.