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QUAYREEL

flexible loading & unloading system

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Our background

Techflow Marine Ltd.
Unit 4
Silverton Court
Northumberland Business Park
Cramlington
Northumberland
NE23 7RY
United Kingdom

We are a global provider of fluid and bulk hose handling systems with associated equipment for the Oil, Gas, Marine, Petrochemical, Renewable and Defence industries.

We design, manufacture, supply, install, commission and perform maintenance of fluid and bulk hose handling systems with associated equipment, power & control systems.

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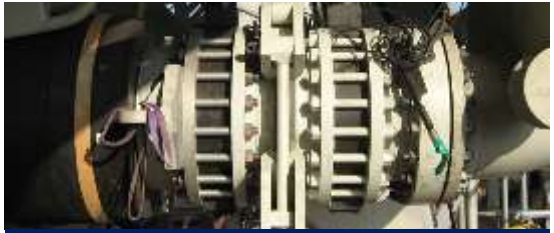
Our solutions at a glance

Tandem mooring and offloading systems

Bunker hose loading stations



Marine couplings

QuayReel® Hose transfer systems

LNG Hose Bunkering and transfer systems

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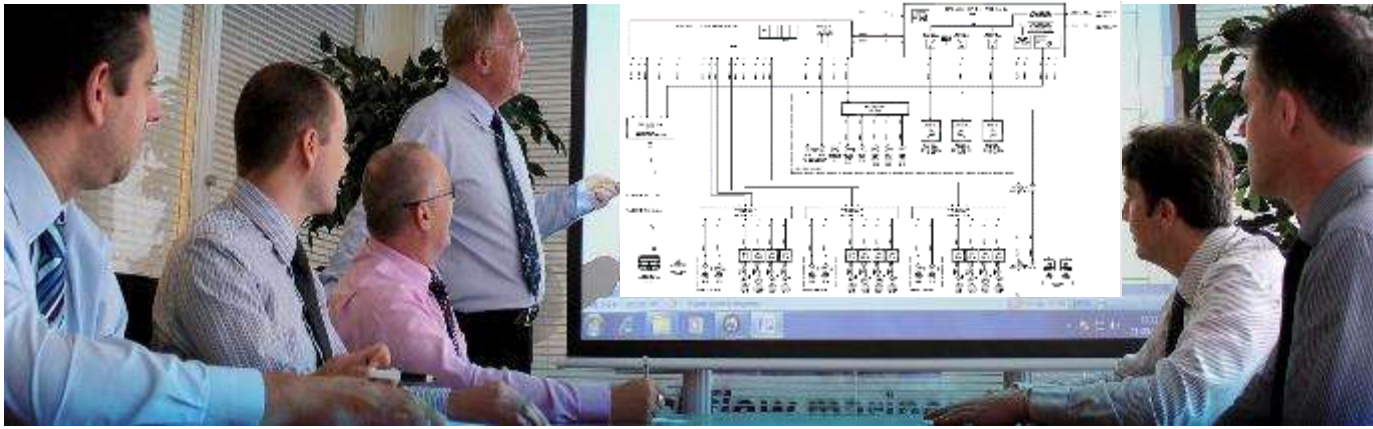
Engineering Capabilities & Engineering Support Team

Engineering Capabilities:

- *3D Modeling (Auto-Desk Inventor)*
- *FEA*
- *Hydrodynamic Analysis (Orcaflex)*
- *CFD*
- *Mechanical/Structural Design*
- *Electrical & Control System Design*
- *Hydraulic System Design*



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Manufacturing Capabilities

- *32,000 sq ft UK manufacturing facility*
- *Strategically located manufacturing partners globally*
- *Ability to use local manufacture, whether by customer requirement or preference, allows us to provide more cost effective solutions, eliminating expensive additional shipping costs post manufacture.*
- *All suppliers and manufacturing partners have passed a full audit by Techflow Marine as part of our QA programme and procedures*

ABS · Bureau Veritas · DNV · Lloyd's Register

Support, Maintenance & Service

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- *Installation*
- *Commissioning*
- *Testing*
- *Training Programs*
- *Service Agreements*
- *Annual Inspection/Surveys*
- *Genuine Spare Parts.*



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Quality, Safety & Environment

Techflow Marine operates to the following standards:

Current accreditation: ISO 9001:2015 by Lloyd's Register

QA and environment: ISO 14001:2015

OHSAS: ISO 45001:2018

(Accreditation scheduled for 2021)

Lloyd's Register

FPAL

JQS

Achilles

Heritage and History

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1960

K&B Beattie *was originally formed in 1960 as a High Pressure fitting manufacturer – originally for the Coal Board industry.*

1976

K&B Beattie *diversified into the offshore oil industry with the manufacture of specialist couplings for the North Sea market.*

1979

K&B Beattie *starts a joint venture agreement with Taurus in Hungary and develops a range of specialist High Pressure hose & couplings for drilling applications.*

1981

International manufacturing depots set up in a number of key locations such as Houston, Calgary and Aberdeen.

1983

Ken Beattie *sits in API committees to help establish the new standards for High Pressure drilling and production hoses.*

1990

Formation of ***Beattie (USA),*** *with new location, a new 60,000 sq ft manufacturing plant in Houston, Texas.*

1992

K&B Beattie *moves into a new 100,000 sq ft manufacturing facility in Ashington, England.*

1997

K&B Beattie *sets up a new coupling machining facility in Bedlington, England.*

2000

The company is acquired by Phoenix AG and is re-named as ***Phoenix Beattie***

2002

Ken Beattie withdraws from company and establishes ***Techflow Group*** *of companies*

techflow Group
OFFSHORE AND MARINE SYSTEMS

2004

Phoenix AG is acquired by Continental AG and Phoenix Beattie re-named as ***Contitech Beattie***

2005

Techflow Marine *is established, designing and manufacturing hose handling systems.*

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OFFSHORE AND MARINE SYSTEMS

The key members of Techflow Marine's design, engineering, construction and technical support team have been responsible for the supply of Offloading Hose Reels since 1993

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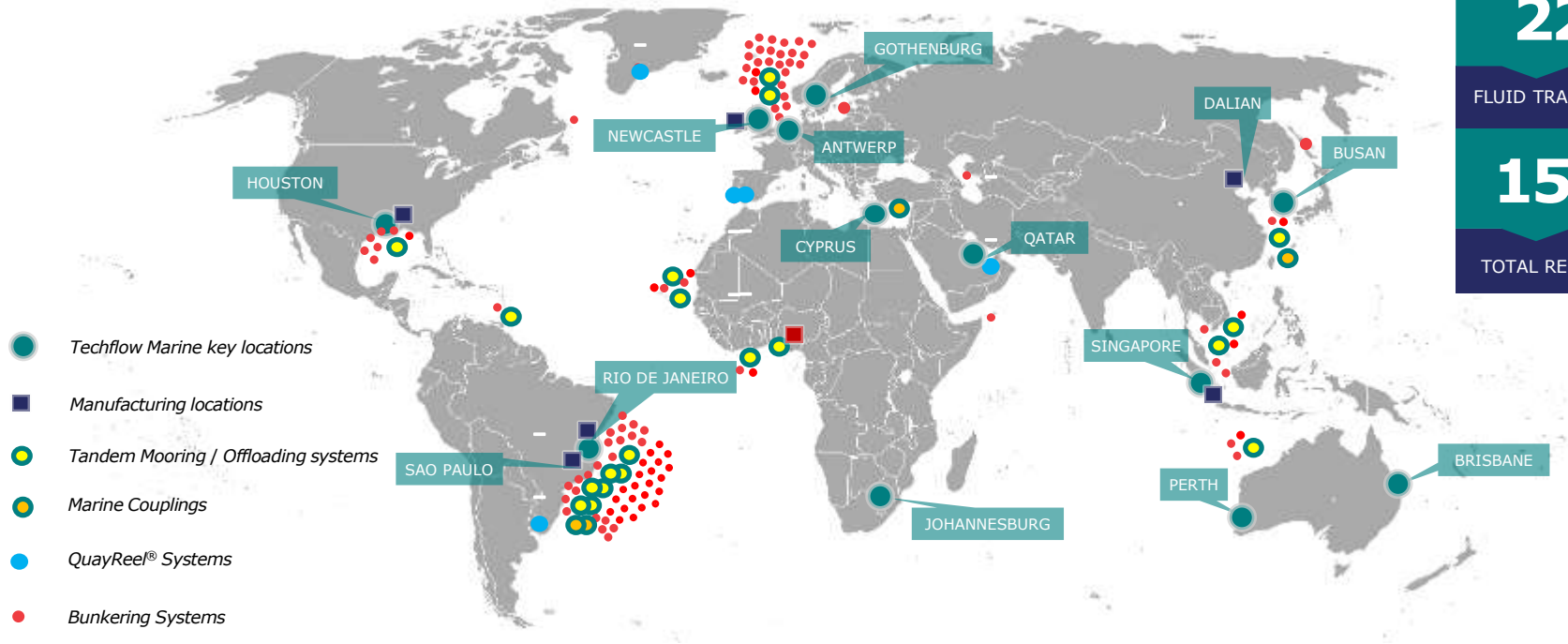
Techflow Marine Key Locations

We care about our clients and equipment and have planned expansion for further premises, representatives and approved manufacturing and service locations worldwide.



220+

FLUID TRANSFER SYSTEMS

1500+

TOTAL REELS DELIVERED

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A selection of our clients and users

QUAYREEL
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Quay Reel ® Tanker Loading & Unloading System

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Hose reels traditionally used in harsh offshore conditions








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Proven design – built to last

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Is a hose an alternative to a loading arm?

Bad reputation based on:
- *Quality of hoses of 40 years ago*
- *Difficult handling and operation*
- *Leading to maltreatment*
- *Unsafe working conditions due to tripping hazards*






Life time of hoses shortened by

- *Crushing by vehicles*
- *Abrasion on jetty deck*
- *Exceeding MBR leading to kinking*

What is the difference between a QuayReel® and a hose tower?

Hose tower is a combination of a loading arm and a hose handling system that combines the worst of the two:

- *Big structure on the jetty to carry the hoses either in saddles or hanging from a riser pipe*
- *Hoses under constant stress of carrying their own weight*
- *High maintenance requirements on winches, swivel joints and structure*
- *High dynamic loads on jetty deck (wind load)*

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QuayReel® offers the best of both worlds

- *Flexibility and freedom of range of a hose*
- *Safety and ease of operation of a loading arm*
- *Small footprint on jetty*
- *Modular design allows flawless extension to adapt to future demands*
- *Clean and safe work environment on the jetty*
- *Proper treatment of hoses to maximise operational hose life time*

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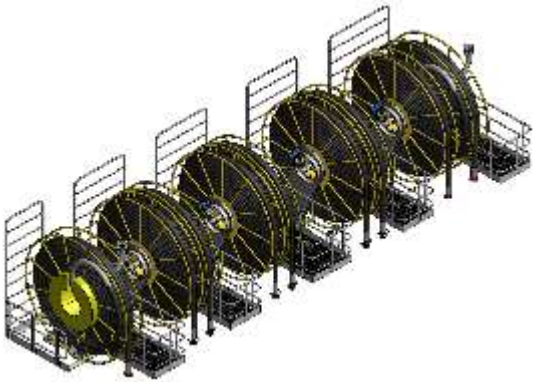
Modular design features – easy to adapt to future needs

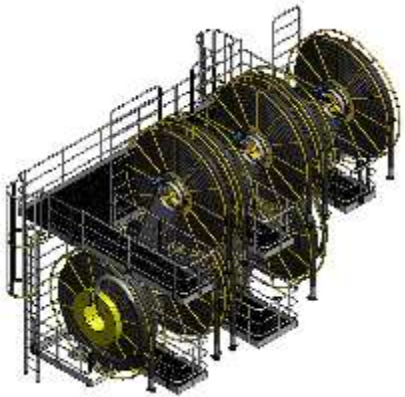
One-reel unit

Three-reel unit

Two-reel unit



Nine-reel unit



Nine-reel unit stacked

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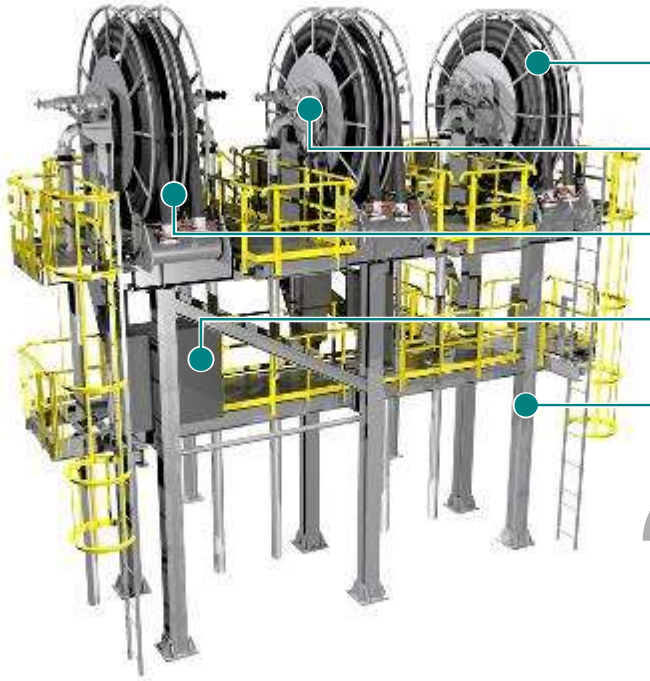
Modular design features – Overview



Marine Break-Away Couplings
Weak link dry break couplings between hose sections.

Hose Auto-Wind Feature
Automatically deploys hose if vessel moves away.

Suction & Delivery Hoses
Custom made to suit product.

Power & Control
Hydraulic, electric or pneumatically driven.

Raised Quay Reel Platform
Bespoke design to suit site application.

Wireless Control Unit
Improves operator visibility & safety.

PATENT APPLIED 14382336.7

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Quayside Service Wet Supply Systems

Standard compact units for small size bunkering and supply services

Modes of operation

QuayReel® can be supplied with hydraulic, pneumatic or electric drives.

Control through panel at base of reel or through handheld radio remote unit

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LV panels and shore post arrangements

Design, manufacture and installation of:

- *MCC (motor control systems)*
- *Switch gear distribution equipment*
- *Electrical installations*
- *Bespoke control systems*
- *Innovative control solutions that meet and exceed clients' expectations*

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Unlimited applications

Compatibility	QuayReel®
Crude oil	☑
Refined products	☑
Solvents	☑
Acids (HCl, H_2SO_4, etc)	☑
LPG	☑
Ammonia	☑
Cryogenic (LNG, Hydrogen)	☑

Design features	QuayReel®
Emergency Release Couplings	☑
SCADA / MODBUS interface	☑
ESD1 / ESD2 signals	☑
Self draining design	☑
Piggable applications	☑
Heat tracing	☑
N_2 purging	☑

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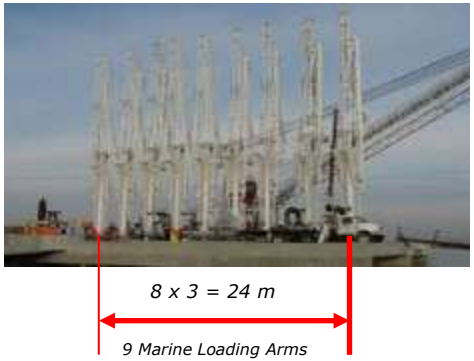
Features and benefits

A fresh look on tanker loading operations taking care of your pains on

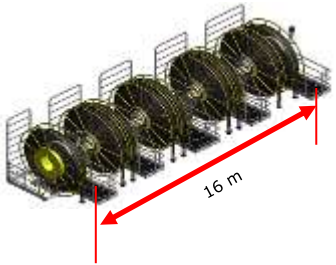
- ❑ *Footprint and jetty deck space*
- ❑ *Jetty deck loads*
- ❑ *Flexibility in connections*
- ❑ *Operating envelopes*
- ❑ *Environment, Health and Safety*
- ❑ *Maintenance*
- ❑ *Operational expenditure*
- ❑ *Capital expenditure*

Footprint and jetty deck space



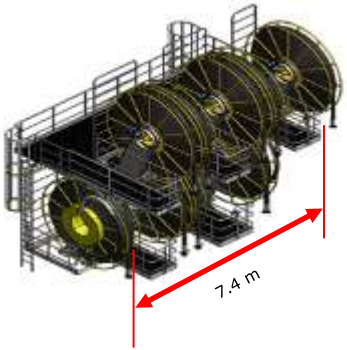
9 Marine Loading Arms

vs

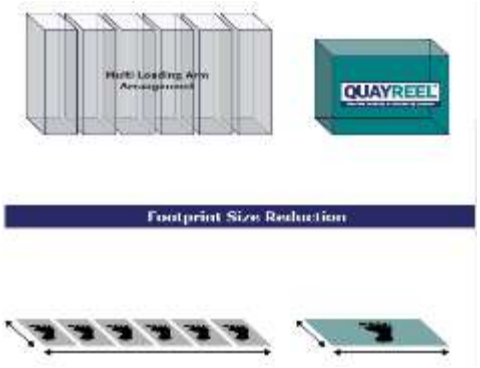


9-reel QuayReel® system

vs



9-reel QuayReel® system



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Jetty deck loads

Dead weight (approximate / average)

Marine loading arm	Total weight (metric tonnes)	QuayReel®	Total weight (metric tonnes)	Δ
6" – DN150	10	6" – DN150	3	70%
8" – DN200	12	8" – DN200	4	66%
10" – DN250	15	10" – DN250	5	66%
12" – DN300	18	12" – DN300	6	66%

Wind loads

Loading arms stand as high structures impact to high wind loads creating very high dynamic loads and subject to restrictions in operation.

OCIMF guideline for marine loading arms:

3.10.15 Wind velocities for loading arm in operation (long time) is 17m/s, in stored attitude(short time) is 55m/s.

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Flexibility in connections

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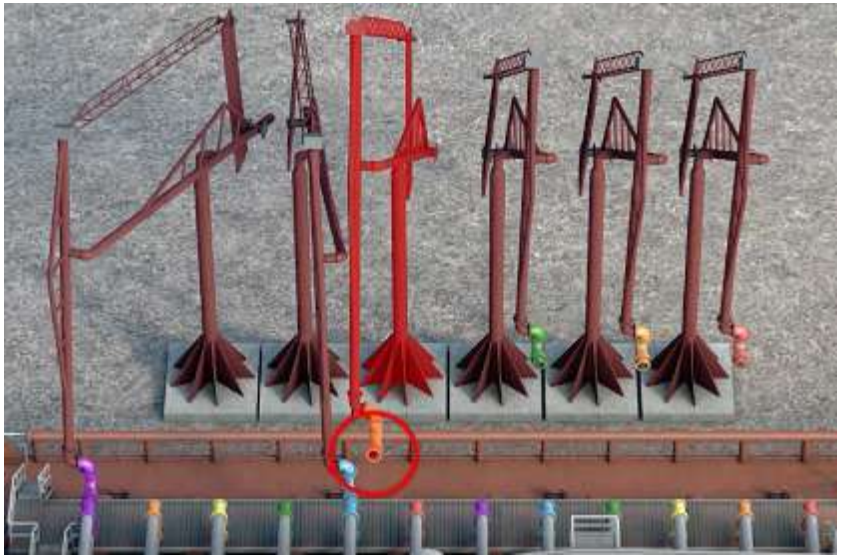
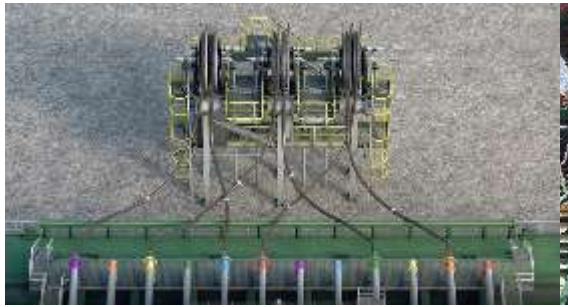
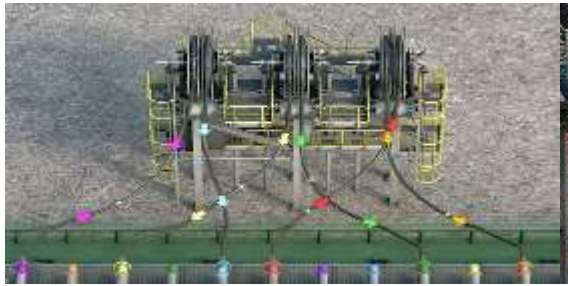
Flexibility in connections

Simultaneous loading of different products



With loading arms only possible if loading arms positioning is adapted to ships manifold configuration. No cross-over possible. Piping on loading arms will clash.





No restrictions in connection scenarios with the QuayReel® system. Cross-over of lines without limits, providing full flexibility in operations and greater versatility in logistics.

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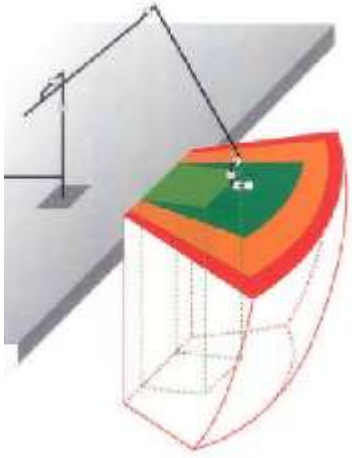
Operating envelopes

Loading arm envelope is limited in all directions

Typically the operating envelope of a marine arm is a 5 m square box dictating precise mooring/positioning of the tanker.

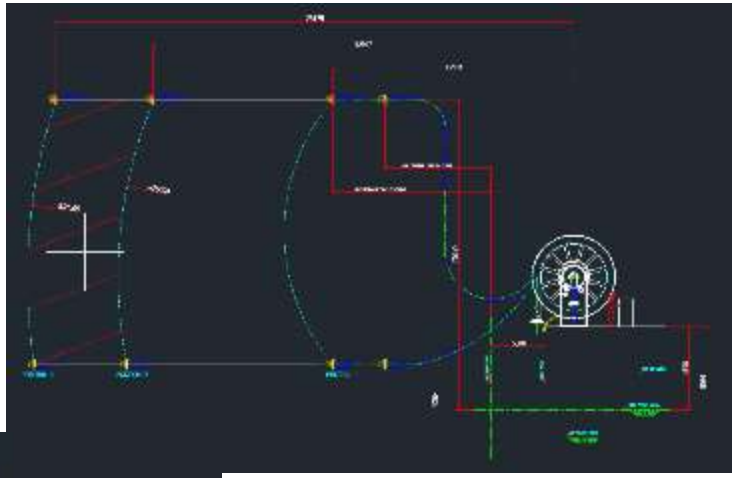
Green box is the connection area
Orange box is alarm area in which loading cycle is interrupted.
Red box is emergency release area.

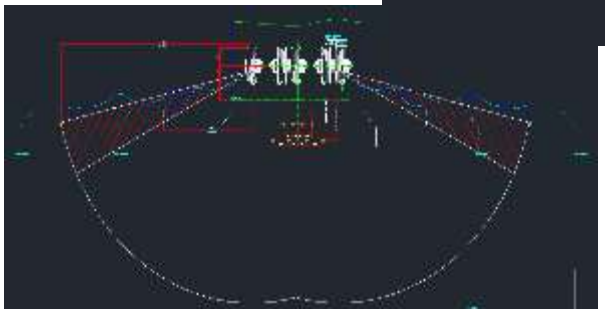


QuayReel® envelope is a radius with full flexibility of the reach of a hose in all directions.

Mooring of vessel is less critical, movement of vessel within margins is more forgiving.

Less interruption of operations





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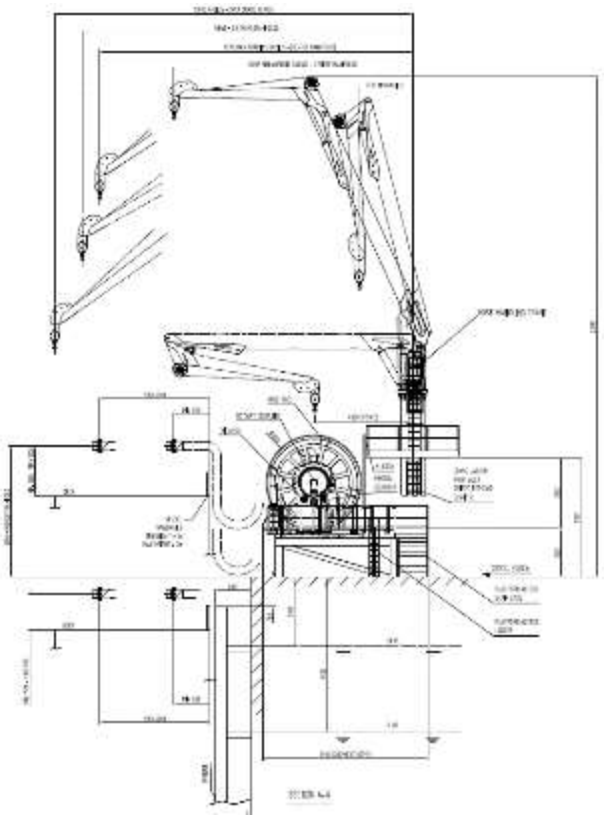
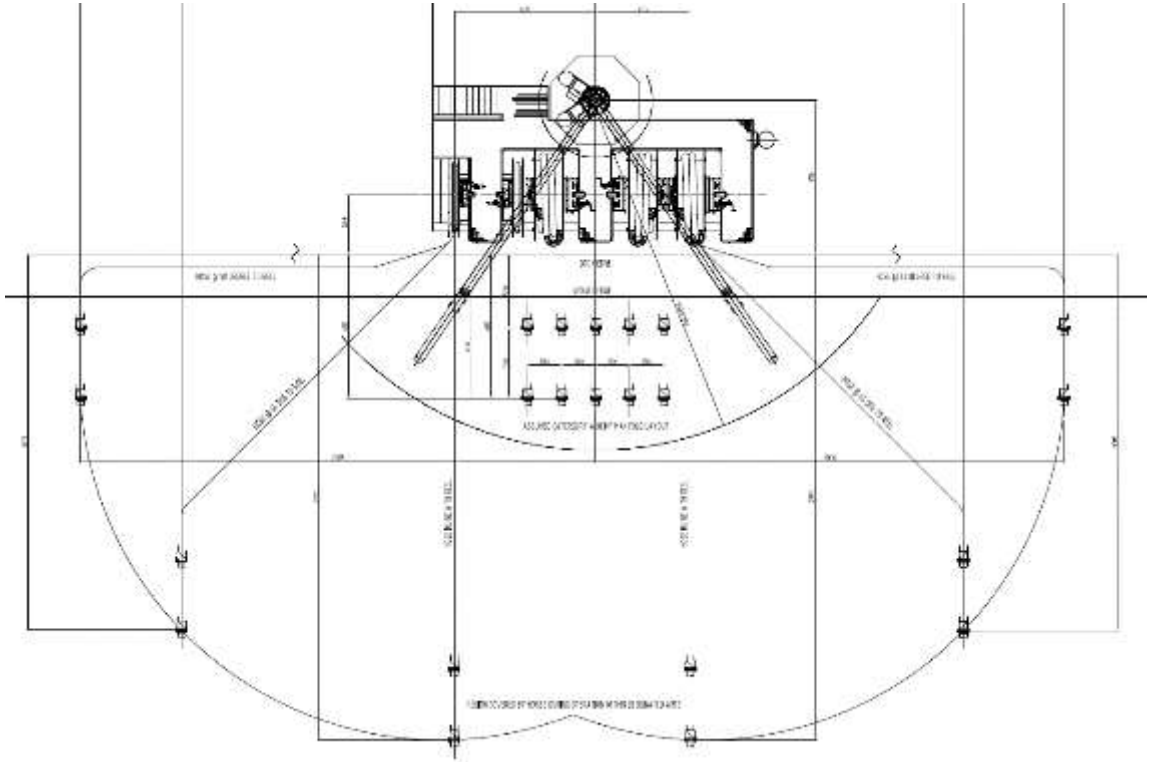
Operating envelope with crane





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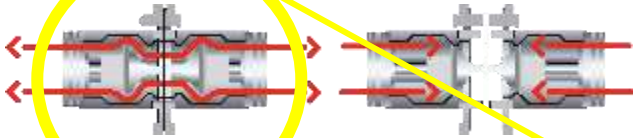
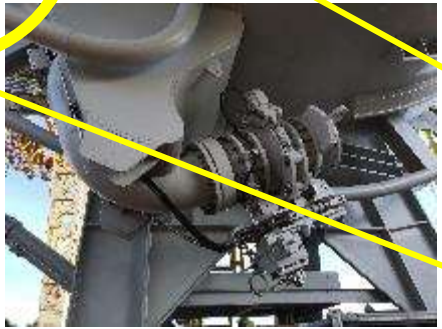
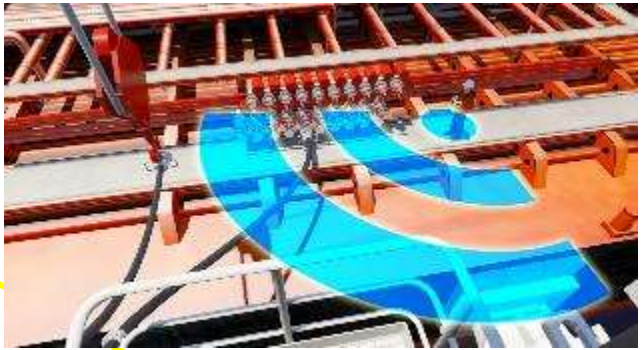
Environment, Health and Safety

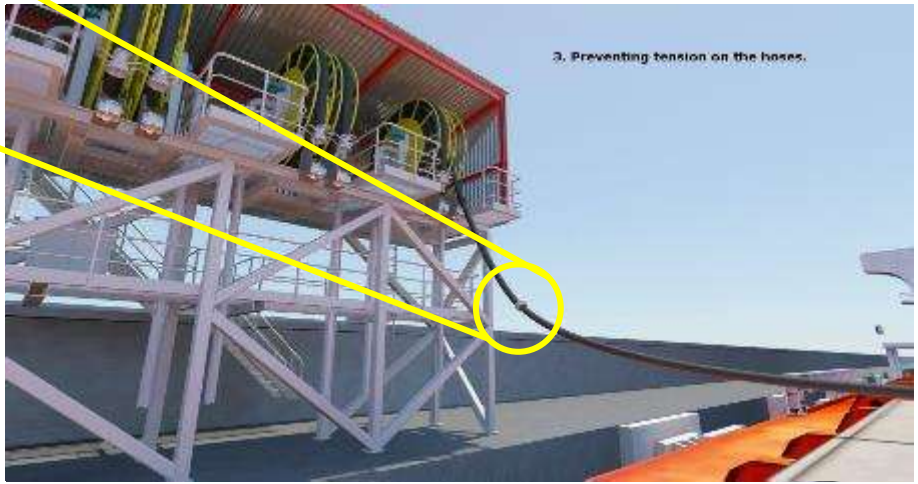




Safety break away coupling
- *inline spring loaded disc valves or full bore design*
- *Passive or active activation*
- *Prevention of spill and damage to equipment*



Remote control unit
- *Primary control at QuayReel® unit*
- *Secondary wireless pendant*



Unique Hose Auto-Wind feature
Pays out hose automatically if vessel moves within operating envelope reach

Maintenance

Marine loading arms
- *Require cranes, rope or scaffolding at high costs and risks for maintenance crew*
- *In case of maintenance or repair, jetty operations very limited.*
- *Significant downtime (up to 20%)*

QuayReel® maintenance
- *No cranes or scaffolding required*
- *All parts accessible from operators platform*
- *Very little to no downtime (< 0.5%)*

Description of part	***QuayReel® No. of parts installed***	***Marine loading arm***
Swivel joints	*1*	*6 – 8 depending on manufacturer*
Hydraulic drive/gear	*1*	*3*
Structural bearings	*1*	*3-6 depending on type of MLA*
Hydraulic solenoid valves	*1 – 2 depending on ERS system*	*3 – 5 depending on ERS system*
Alarm sensors on operating envelope	*Decoder in reel*	*6 – 12 depending on ERS system*

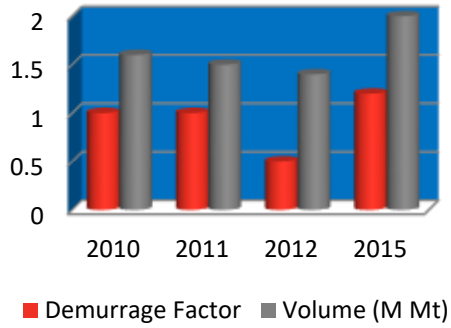
Operational expenditure

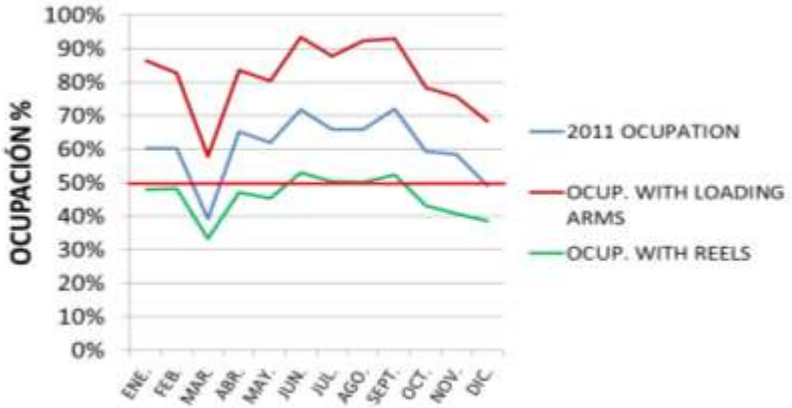
Where do you save?

Efficiency in loading/unloading cycles
- *Less demurrage*
- *More capacity at jetty*

Stock of critical spare parts (upto 75% savings)
- *Less parts*
- *Increased life time of hoses compared to hose towers*

Maintenance cost (upto 75% savings)
- *No cranes or scaffolds*
- *No working at heights*
- *Less parts, faster routines, less downtime*





Capital expenditure

Where do you save?

- *Jetty structure carries upto 50% less loads giving substantial saving potential in jetty construction*
- *Jetty space needed is upto 50% reduced giving substantial saving potential in jetty construction*
- *QuayReel® initial equipment investment upto 30% lower than loading arms*
- *Low shipment volume/cost*

QuayReel® units packed and ready for container shipment

Marine loading arm shipment in large dimensions and at high costs

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Features and benefits

A fresh look on tanker loading operations taking care of your pains on

- *Footprint and jetty deck space*
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- *Flexibility in connections*
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- *Capital expenditure*

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QuayReel® references

Project	Installation type	Owner	Client	Location	Equipment	Year of award
Tortue Hub Terminal	QuayReel®	BP	Saipem	Senegal - Mauritania	4 x QuayReel® station, 2" & 3", Diesel, Sludge	2021
JP8 Refuelling Reels	QuayReel®	USAF	USAF	Thule, Greenland	2 x QuayReel® station, 8" Diesel oil, 200m length hoses	2021
Chemical Discharge System	QuayReel®	UPM	UPM Bioforce	Montevideo, Uruguay	3 x QuayReel® station, 8", Caustic Soda, Sulphuric Acid and Fuel Oil	2020
New Port Project	QuayReel®	Qatar Navy	Qatar Navy	Qatar	50 x QuayReel® station, Diesel, Waters, Oils and Slops	2020
Freeport, Grand Bahama Island	QuayReel®	Buckeye Partners	Buckeye Partners	The Bahamas	1 x QuayReel® station, 4", Diesel	2019
Puerto de Ceuta	QuayReel®	Petrolífera Ducar	Petrolífera Ducar	Port of Cueta, Spain	3 x QuayReel® station, 10", heavy fuel oils and crude oil	2018
Huelva Refinery	QuayReel®	CEPSA	CEPSA	Spain	2 x QuayReel® station (2 x 1 reel systems) Phenol Vapour Recovery (heat Traced Hoses) on horizontal reels	2016
Huelva Refinery	QuayReel®	CEPSA	CEPSA	Spain	2 x QuayReel® station (2 x 1 reel systems) Phenol loading (heat Traced Hoses)	2016
JP8 Refuelling Reels	QuayReel®	USAF	USAF	Thule, Greenland	2 x QuayReel® station, 8" Diesel oil, 200m length hoses	2017
Huelva Refinery	QuayReel®	CEPSA	CEPSA	Spain	2 x QuayReel® station (2 x 6 reels) Chemical Loading Systems	2014

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Thank you for your attention!

We'll take any time for your questions now