



techflow **marine**

OFFSHORE AND MARINE SYSTEMS

QUAYREEL®

flexible loading & unloading system



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A New Efficient Tanker Loading & Unloading System

Techflow Marine's Quay Reel® system offers significant improvements over conventional port and terminal fluid transfer systems such as reduced loading times, less dock space, increased safety and reliability.

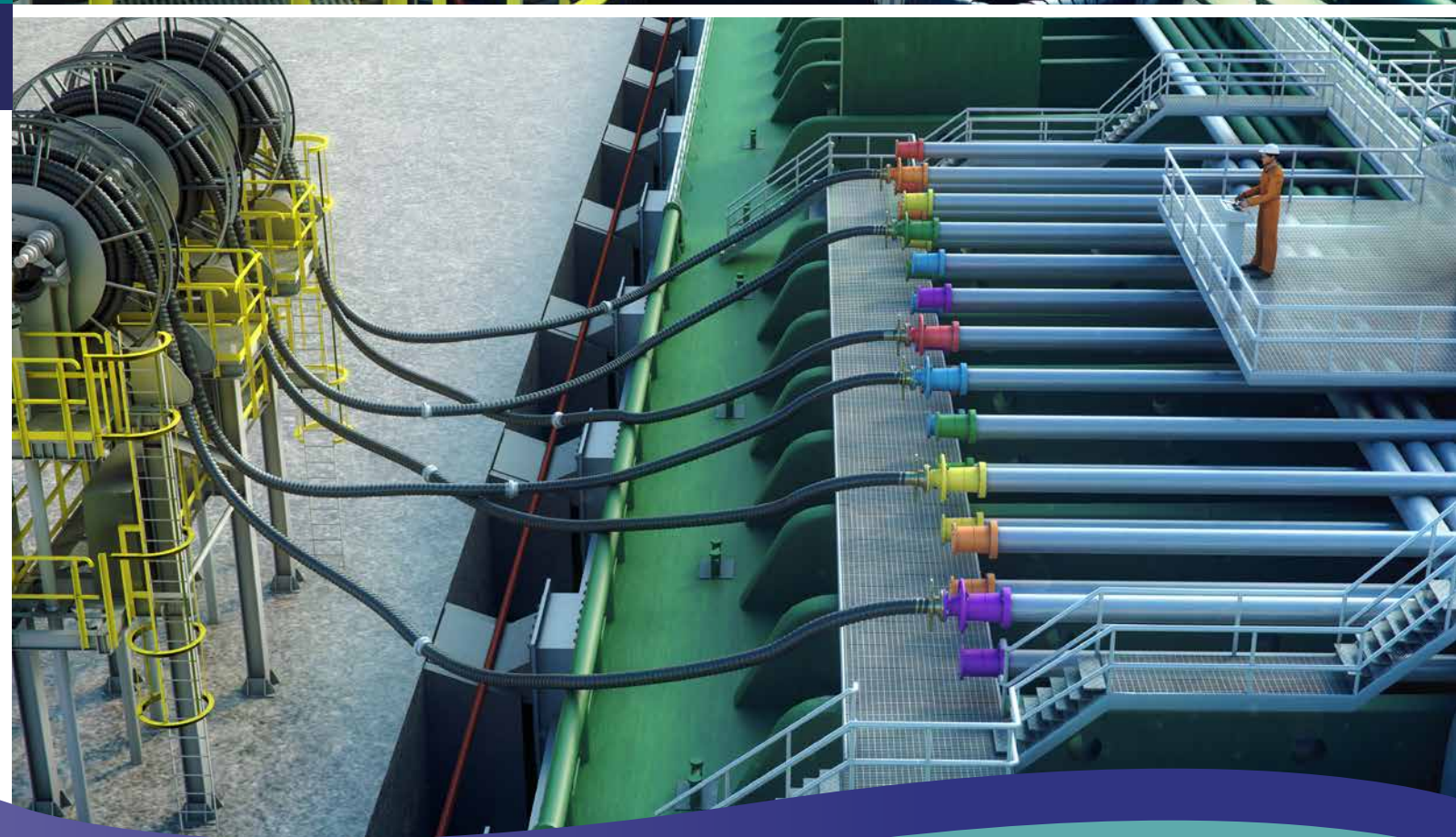
Techflow Marine are a proven global supplier of fluid transfer systems to the oil, gas and petrochemical industries, delivering solutions to major blue chip companies worldwide.

Working together with an international petrochemical company Techflow Marine has developed a new, more efficient loading and unloading system that facilitated reduced loading times, less demurrage and sustainable future increase in volume.

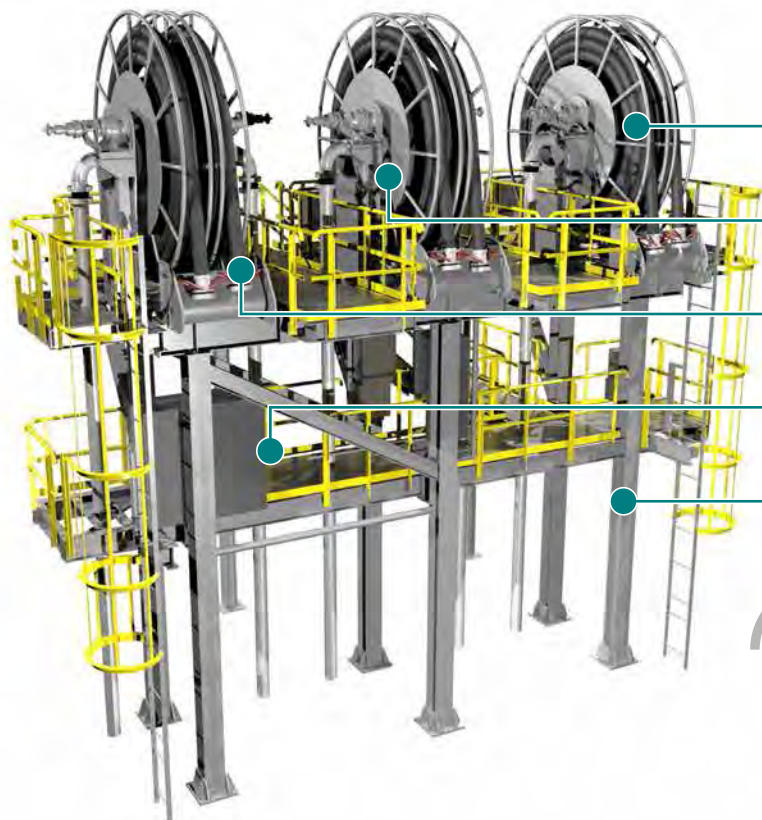
The solution provided by Techflow Marine was a multi-product loading system that allowed simultaneous and safe loading of fluids to product tankers fulfilling the clients key project drivers.

The Quay Reel® loading and unloading system is based on technology already proven in the offshore oil and gas industry where Techflow has supplied over 1000 reels of this type, on over 100 separate projects. The equipment is often installed in extreme and harsh environments with some of the world's toughest safety requirements.

For over 20 years this type of package has proved to be a safe, reliable and robust method of product transfer which is proven to reduce lifetime costs and improve hose life and integrity whilst providing a flexible, efficient loading solution.



Techflow Marine Quay Reel ®



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.

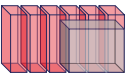
Wireless Control Unit
Improves operator visibility & safety.

PATENT APPLIED 14382336.7

'REINA SOFÍA' PROJECT
Cepsa's Palos de la Frontera Refinery
Huelva, Spain



Key Features & Benefits



✓ Envelope Size Reduction



✓ Footprint Size Reduction



✓ Minimises Spillage Risk



✓ Maintenance Reduction



✓ Reduces Operation Times



✓ Reduces Port Occupation



✓ Tanker Fuel Savings



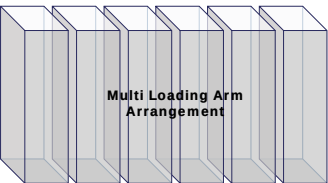
✓ Reduces CO₂ Emissions

Envelope & Footprint Reduction

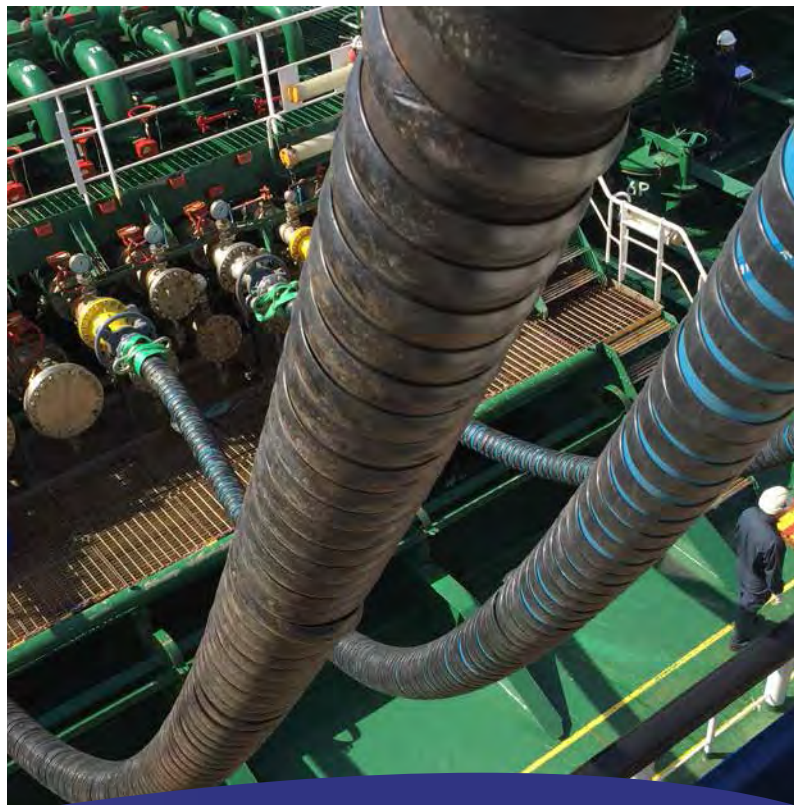
Multi Loading Arm Arrangement

New Quay Reel ® Loading System

Envelope Size Reduction



Footprint Size Reduction



CEPSA Tanker Loading Case Study

This is the first system of its kind and was developed for multinational petrochemical company CEPSA in order to replace their existing loading arms. This project demonstrates Techflow Marine's collaborative approach to developing bespoke products in line with customer requirements.

Our innovative new system permits simultaneous loading of ALL available products, reducing loading operation times by 50-60%

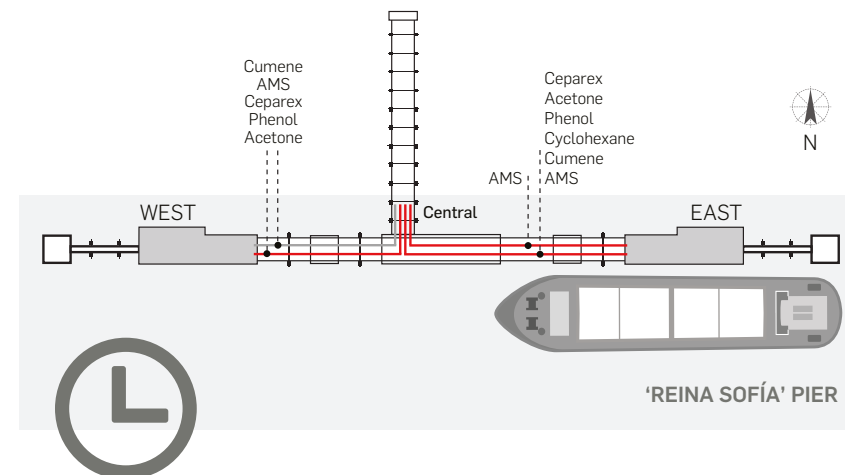
José María Cuadro Saéz

Director de Supply Chain de Petroquímica de Cepsa

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OFFSHORE AND MARINE SYSTEMS

01. STARTING POINT

THE 'REINA SOFÍA' PIER IN HUELVA SHOWS SIGNS OF SATURATION



2014 THE DELAYS IN OPERATIONS ON THE PIER REACHED THEIR LIMIT

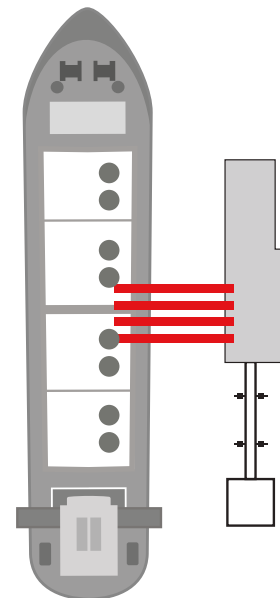
The increase in volume caused delays of up to 3,000 hours between 2010-2011
The port suffers delays when it operates at over 50% capacity
The impact of delays increases exponentially with occupation rates



Loading and unloading of tankers will no longer be viable in 2015 without a new system

02. PREVIOUS

LOADING ARMS SYSTEM



LOADING ARMS

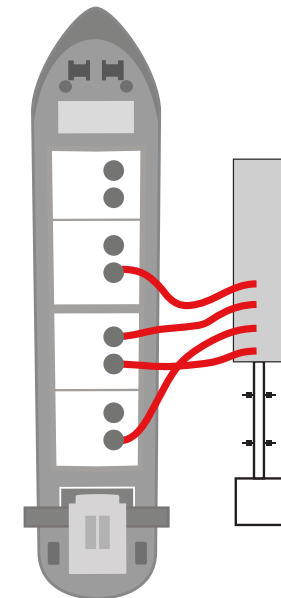
- Only one can be connected at a time
- They cannot cross each other's paths
- The tanker must be moved to fit each arm

WHY DO THEY CAUSE DELAYS?

- There are only two berths for tankers
- Not all products are available at each berth
- Distant and rigid loading arms
- High loading times
- Limits on loading of combined products

03. CURRENT

HOSE SYSTEM



HOSE REELS

- System untried in ports until now
- Proven robustness in all types of conditions
- Certified by classification associations

WHY IS VIABILITY GUARANTEED?

- Allows for simultaneous loading with complete flexibility
- Less complex system than loading arms
- Incorporates innovative safety measures
- Includes additional protective "shell"
- System features Wi-Fi control

04. RESULTS

AFTER ROLL OUT

1 **MAXIMUM SAFETY:** MINIMIZES RISK OF ACCIDENTAL SPILLAGE



0

2 **OPERATION TIMES ARE REDUCED BY BETWEEN 50% AND 60%**



-50% -60%

3 **HUELVA REFINERY PORT FACILITIES OCCUPATION RATE IS REDUCED BY 20%**



-20%

4 **FUEL SAVINGS FOR TANKERS**



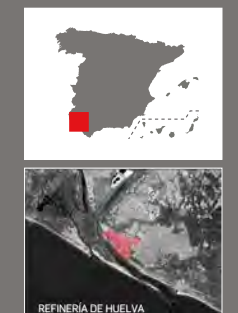
400T/YEAR

5 **FUEL SAVINGS MEAN A REDUCTION IN CO₂ EMISSIONS**



-20%

LOCATION



Start of project:
OCTOBER 2013
Start of operations:
MARCH 2015



NEW SYSTEM IN DETAIL



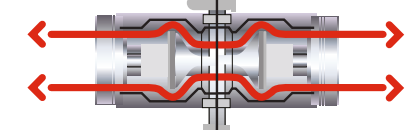
HOSE SECTION

Suitable for working with 98% of existing chemical products.

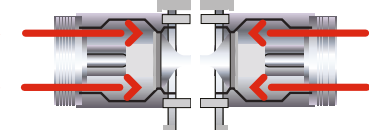
WEAK LINK, THE KEY TO SAFETY

- The new hose's safety fitting system reduces any risks to a minimum

Open flow



Closed flow



HOSE WINDING REELS



- A system of 5, thirty metre long hoses
- Electro-hydraulic drive
- Activated by remote control

INCREASED VOLUME OF FORECAST FOR 2015
+33%

Cepsa has patented the technology used in collaboration with TechFlow Marine



QUAYREEL®
flexible loading & unloading system



-   **MAXIMUM SAFETY**
-   **SIMULTANEOUS LOADING**
-   **REDUCE OPERATION TIMES**
-   **REDUCE PORT OCCUPATION**
-   **TANKER FUEL SAVINGS**
-   **REDUCE CO₂ EMISSIONS**

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