



The Benefits of DockReel v. Loading Arms

WHITE PAPER

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Recent customer data revealed that hydraulically operated Marine Loading arms inspection and maintenance expenditure at the mobilization phase, can run well into six figures due to scaffolding and floating cranes etc. well before any actual remedial work is undertaken.

Feedback from users suggests that Dockreel total cost of ownership is set to be ~25% of that of a traditional Marine Loading Arm.

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Introduction

What are the benefits of a DockReel system over a conventional Marine Loading Arm?

Based on real customer experiences from terminals worldwide, the costs associated with installing and maintaining traditional Marine Loading Arms far exceed initial estimates. While the visible benefits of DockReel, such as increased operating envelopes, reduced capital expenditure, shorter lead times, modularity for expansion, lower weight, and smaller footprint are well documented, customer data reveals three areas where cost differences are dramatically underestimated: **time in port, excessive lead times for Marine Loading Arms can significantly add to lost revenue from on-going operations.**

DockReel Customer-Proven Benefits



Maximum Safety



Simultaneous Loading



Reduce Operation Times



Reduce Port Occupation



Tanker Fuel Savings



Reduce Co2

Time In Port

Operating costs for large tankers range between **\$70,000 and \$100,000 per day**, including rental and crew expenses. Loading and unloading operations average 10 hours and 20 hours, respectively, while demurrage costs for very large crude carriers (VLCCs) reach \$120,000 to \$130,000 per day. In this environment, reducing time in port becomes a financial imperative.

Marine Loading Arms must align precisely with ship manifolds, considering triple swivel assembly design and arm offsets to prevent collision during multiple connections. When a loading arm fails or requires maintenance, simultaneous connections become impossible, extending port time significantly. Evolving vessel designs and manifold configurations further complicate operations, reducing operational flexibility.

DockReel's flexible hose system allows effortless connection to multiple manifold configurations. By serving suction and delivery functions, it dramatically reduces port time and increases operational flexibility.

operating costs can range from
\$70,000 and
\$100,000+ rentals and crew
per day

This flexibility delivers measurable results:

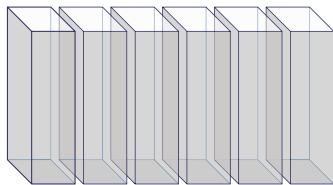
Reduced operating costs for tanker owners and operators through faster turnaround

Increased port flexibility accommodating diverse vessel configurations

Enhanced productivity and throughput with simultaneous multi-point connections

DockReel systems eliminate the delays common with Marine Loading Arms. While MLAs require operations to cease at their first-stage alarm (typically 80% of operating limits), DockReel's extensive operating range and automatic hose tension adjustment ensure continuous operation without interruption, maintaining smooth, uninterrupted flow.

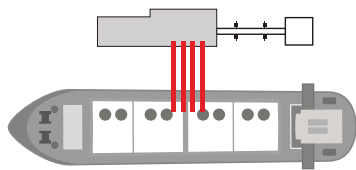
Vertical Height Reduction



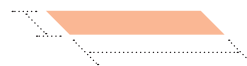
Multi-Loading Arm Arrangement



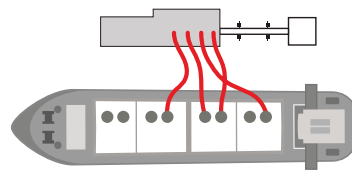
LOADING ARM SYSTEM



DOCKREEL

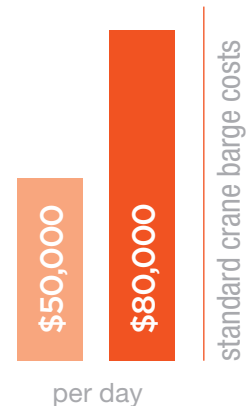


DOCKREEL SYSTEM



Installation

The cost of Marine Loading Arms installation is often underestimated in project planning. Standard crane barges in the US cost **\$50,000 to \$80,000 per day**, excluding premium charges for weekend work, overtime, and availability constraints. Larger floating cranes escalate costs further while extending project timelines.



Marine Loading Arm Installation Requirements:

Secure, flat pre-assembly area requiring several days, depending on complexity

Specialist sling instructions and safety protocols

Slow, methodical process with numerous uncontrollable variables

Substantial dock reinforcement for weight and overturning moment (OTM) support

In contrast, DockReel installations are more straightforward. While crane barges may still be required, DockReel solutions weigh up to **70% less** than equivalent Marine Loading Arms and feature reduced height profiles. These factors substantially reduce the need for heavy lifting equipment, cutting both time and equipment costs.



Most importantly, DockReel systems typically eliminate the need for dock structural modifications, avoiding substantial capital investment in reinforcement required for Marine Loading Arms.

Real-World Cost Analysis

Recent customer experience from major terminals reveals the true financial impact of Marine Loading Arm ownership. Data collected from terminal operators indicates maintenance costs that far exceed industry estimates.

Simple Inspection Costs:

Scaffolding setup around loading arm: \$30,000

Scaffolding removal after completion: \$30,000

Manpower and tools over 4 days: \$20,000

Loading arm downtime over 4 days: Additional lost revenue

Total cost for simple inspection: Up to \$100,000

This dramatic cost increase resulted from safety evolution in the industry. Previously, inspections used crane baskets to lift workers to arm height, but safety concerns eliminated this practice when operators could no longer find personnel willing to work at height in crane baskets.

The scaffolding requirement applies equally to simple inspections and fault searches, explaining why many terminals defer preventive maintenance, ironically leading to higher repair costs and extended downtime.

Major Repair Cost Reality:

- 1. Barge and crane mobilization to site: \$30,000 - \$50,000**
- 2. Scaffolding for preparation and arm removal: \$30,000**
- 3. Scaffolding removal: \$30,000**
- 4. Barge and crane demobilization: \$30,000**
- 5. Transportation to workshop: \$10,000**
- 6. Workshop time (typically 4 months):**
Variable (parts + specialist labor)
- 7. Return transportation to dock: \$10,000**
- 8. Second barge and crane mobilization: \$30,000 - \$50,000**
- 9. Specialist installation services: \$10,000**
- 10. Final demobilization: \$30,000**

Total cost: Up to \$250,000

Maintenance

Data collected from recent customer experience reveals maintenance as the most underestimated cost factor in Marine Loading Arm ownership. Working at significant heights under challenging conditions, each arm contains a minimum of six swivel joints with inner and outer seal rings. Additional systems, including ERC/ERS/QC/DC and associated hydraulic components, create maintenance complexity requiring extensive safety measures and risk assessments.

Over the past 20 years, the cost of Marine Loading Arm parts has increased significantly while availability has become increasingly problematic. Customer data shows that any maintenance requiring arm removal costs a minimum of \$200,000 before addressing the actual problem.



The DockReel Maintenance Advantage

DockReel features a single, non-load-bearing swivel. The absence of load dramatically increases component lifespan. All maintenance occurs at chest height, eliminating height-related safety concerns and cost complications.

**DockReel achieves 99.5% availability,
equating to less than one day of
downtime per year.**

Maintenance Requirements Remain Minimal:

Hydraulic fluid changes - routine service

Main bearing greasing - simple ground-level access

Annual hose hydrostatic testing - Coast Guard compliance

Visual swivel inspection - chest-height accessibility

Motor maintenance - accomplished all at chest height
with plug and play standardized components

When repairs are needed, DockReel's single motor type simplifies maintenance and ensures rapid parts availability, contrasting sharply with Marine Loading Arms' complex, specialized components.

Hidden Infrastructure Benefits

Customer data reveals an often-overlooked DockReel advantage: reduced structural loading allows terminals to defer expensive infrastructure inspections and maintenance.

Structural Load Reduction Benefits:

DockReel's significantly lighter weight and reduced dynamic loading decrease stress on dock structures and pilings. This reduction allows terminals to:

Defer professional diving inspections of underwater structures

Extend intervals between structural assessments

Avoid costly mobilization of specialized inspection equipment

Minimize operational downtime for infrastructure evaluation

These deferred costs represent substantial savings beyond the direct equipment comparison, as professional diving inspections and associated mobilization can cost tens of thousands per event.

The fluid dynamics of a DockReel system behave similarly to those in a straight pipe, which enhances flow efficiency. This design characteristic often allows for a reduction in pipe size—for instance, replacing a 12" loading arm with a 10" hose—without compromising flow rates. As a result, the entire pipeline leading back to the tank can be built using smaller, more cost-effective piping, significantly reducing both material costs and structural load requirements.

Customer Testimonial

Real customer experiences provide compelling validation of DockReel's advantages:

"I am very glad that I was here this week, and after hearing the stories of other terminals and their issues, I will never in my life buy marine loading arms and will definitely go for DockReels."

— Terminal Operator, Beaumont, Texas

This sentiment, expressed at a recent DockReel Innovation Day, reflects growing industry recognition of Marine Loading Arm limitations and DockReel advantages. Terminal operators consistently report surprise at the hidden costs and operational challenges of Marine Loading Arms compared to DockReel's straightforward operation.



Return on Investment Framework

Based on customer data, terminals can calculate DockReel ROI using this framework:

Annual MLA Costs:

Routine inspection: \$100,000 (minimum)

Deferred maintenance risks: Variable

Extended downtime: Lost revenue

Parts availability delays: Operational impact

DockReel Annual Costs:

Routine maintenance: <\$5,000

Downtime: <1 day per year

Parts availability: Immediate

Conclusion

Customer data and real-world experiences demonstrate DockReel's overwhelming advantages over traditional Marine Loading Arms:

Proven Cost Benefits

- **Total cost of ownership:** Only 25% of traditional MLA costs
- **Maintenance simplicity:** Ground-level access eliminates height-related expenses
- **Operational uptime:** Greater than 99.5% availability

Enhanced Safety and Simplicity

- **Reduced complexity:** Fewer components requiring maintenance
- **Improved safety:** All maintenance is performed at chest height
- **Extended lifespan:** 30+ years with minimal downtime

Infrastructure Advantages

- **Lighter weight:** Reduces structural stress and inspection requirements
- **Smaller footprint:** Maximizes available dock space
- **Installation simplicity:** Eliminates the need for structural reinforcement

Customer Validation

Terminal operators worldwide are making the definitive switch to DockReel technology. As one customer stated, the choice becomes clear once the true costs and operational realities are understood.

The evidence is overwhelming: DockReel represents the future of marine loading and unloading solutions.



Appendix:

Cost Comparison Summary

Cost Category	Marine Loading Arms	DockReel	Savings
Simple Inspection	Up to \$100,000	<\$1,000	>99%
Major Repair (Pre-work)	\$200,000+	<\$5,000	>97%
Annual Downtime	Multiple weeks	<1 day	>95%
Structural Requirements	Significant reinforcement	Standard dock	Variable
Total Cost of Ownership	100% (baseline)	25%	75%

***DOCK*REEL**



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