INDUSTRY WHITEPAPER

S&S TECHNICAL
ENGINEERING | FABRICATION | AUTOMATION

RETHINKING LOADING RACK PROCUREMENT

How Integrated Process System Providers Can Reduce Total Installed Cost

LOWER TOTAL INSTALLED COST

SIMPLIFIED PROCUREMENT AND EXECUTION

REDUCED RISK AND INTERFACES

IMPROVED PROJECT OUTCOMES AND RELIABILITY

A practical guide for terminal operators, pipeline companies, chemical manufacturers, EPC firms and refinery owners.

INSIDE THIS WHITEPAPER

Why the lowest equipment price is not always the lowest installed cost

Understand the full picture of total installed cost beyond the equipment quotation.

The hidden cost of fragmented engineering

See how multiple suppliers and interfaces drive cost, risk, and complexity.

How integrated procurement reduces risk

Learn how one engineering team simplifies execution, reduces interfaces, and improves project performance.

Strategies to reduce freight & fabrication costs

Discover how local fabrication and smart logistics can deliver significant savings.

Questions every owner should ask before issuing an RFQ

Use a practical framework to evaluate procurement strategies beyond equipment pricing.

DESIGNED FOR

EPCs | REFINERIES | PIPELINES | CHEMICAL PLANTS | TERMINAL OPERATORS

A practical guide for terminal operators, pipeline companies, chemical manufacturers, EPC firms and refinery owners.

Executive Summary

For decades, owners have traditionally purchased loading racks from companies whose primary business is designing and fabricating loading platforms and fall protection systems. That procurement model has served the industry well and remains appropriate for many standalone loading rack projects.

However, today's loading facilities are becoming increasingly integrated.

Modern truck and rail terminals frequently combine custody transfer metering, pumping systems, additive injection, compressor skids, chiller packages, loading arms, vapor recovery, automation, overfill protection, controls and structural loading racks into a single operating system.

As projects become more complex, many owners continue to procure each discipline independently, resulting in multiple engineering firms, duplicated effort, additional freight, fragmented procurement, and increased project management requirements.

An alternative approach is emerging.

Rather than viewing the loading rack as the primary purchase, some owners are evaluating the loading facility as an integrated process system.

When engineered together, loading racks become one component of a larger package rather than a standalone product. This shift can reduce engineering interfaces, simplify procurement, lower freight costs, improve constructability, and reduce total installed cost.

This whitepaper examines how integrated process system providers who also provide loading racks and fall protection, as well as a full compliment of accessories, offer owners an additional procurement strategy for projects involving complete loading facilities.

■ EXECUTIVE INSIGHT 01

TOTAL INSTALLED COST MATTERS MORE THAN EQUIPMENT PRICE

The lowest equipment price does **not** necessarily result in the lowest total installed project cost.

While equipment pricing is important, owners should also evaluate engineering coordination, freight, construction efficiency, procurement complexity, and long-term maintainability. Optimizing the complete project—not just one component—often delivers the greatest overall value.

■ EXECUTIVE INSIGHT 02

INTEGRATION REDUCES PROJECT RISK

Projects become more predictable when process equipment, structural systems, controls, and loading infrastructure are engineered as one integrated solution.

A single engineering team reduces design interfaces, minimizes coordination challenges, improves constructability, and helps eliminate conflicts that commonly occur when multiple suppliers independently engineer interconnected systems.

■ EXECUTIVE INSIGHT 03

PROCUREMENT STRATEGY CAN BE A COMPETITIVE ADVANTAGE

How a project is procured can influence overall cost as much as the equipment selected.

Evaluating integrated process system providers alongside traditional equipment suppliers may reduce engineering effort, simplify procurement, improve schedule performance, and lower total installed cost without compromising quality or safety.

The Industry Has Changed

Twenty years ago, a truck loading rack often consisted of little more than a steel platform, a loading arm, and a few valves.

Today's facilities are dramatically different.

A modern loading terminal may include:

- Custody transfer metering
- High-capacity pumping systems
- Variable frequency drives
- PLC-based automation
- Safety instrumented systems
- Vapor recovery
- Additive injection
- Sampling systems

- Heat exchangers/Chillers
- Blending systems
- Truck scales
- Operator interfaces
- Remote monitoring
- Cybersecurity integration

As facilities become increasingly sophisticated, the loading rack itself often represents only a small percentage of the total project investment.

Think Beyond the Loading Rack.

*The loading rack is often **only one element** of a complete engineered loading facility.*

*The greatest project value is achieved when the **entire system** is designed, integrated, and optimized as a single operating solution.*

Why Owners Still Buy Loading Racks the Same Way

This page explores why procurement practices have changed more slowly than facility design.

Traditionally, owners begin with a loading rack supplier and then separately procure pumps, metering skids, controls, instrumentation, loading arms, electrical systems, and installation services.

While this approach has produced successful projects for decades, it also creates numerous engineering interfaces that require coordination throughout design, fabrication, construction, and commissioning.

The result is not necessarily a poor project—but it may not be the most efficient one.

The question is no longer:

"Who builds the best loading rack?"

The more valuable question may be:

"Who can optimize the entire loading facility?"

The Hidden Cost of Fragmented Procurement

Why Equipment Pricing Often Overshadows Project Economics

Industrial owners invest significant time negotiating equipment pricing.

Purchase orders are scrutinized.

Competitive bids are requested.

Margins are evaluated.

Yet one of the largest opportunities for reducing project cost frequently receives far less attention:

The cost of managing multiple suppliers.

For many truck and rail loading facilities, procurement decisions are still made one discipline at a time.

A loading rack supplier is selected.

Later, pumps are purchased.

A separate vendor supplies custody transfer metering.

Loading arms come from another manufacturer.

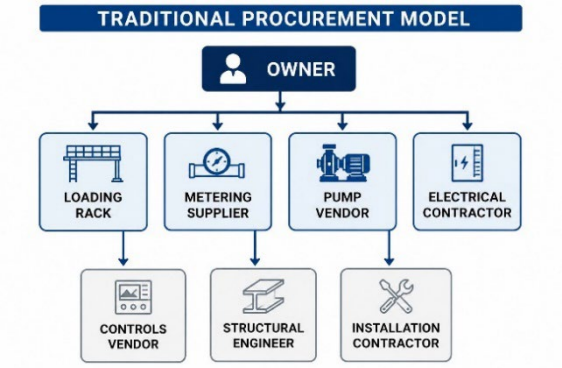
Controls are engineered independently.

Electrical integration is completed by yet another contractor.

Each supplier may be highly qualified.

The challenge is not the quality of any individual vendor.

The challenge is the growing number of engineering interfaces required to make the complete facility operate as one integrated system.



Typical Result

✓ Multiple purchase orders

✓ Multiple engineering firms

✓ Separate project schedules

✓ Separate drawing packages

✓ Numerous coordination meetings

✓ Multiple freight shipments

✓ Numerous requests for information

✓ Increased owner management

"Every additional supplier introduces another engineering interface that must be coordinated throughout the project lifecycle"

Why Interfaces Matter

Large industrial projects rarely experience delays because individual equipment fails to perform.

More often, delays occur because two suppliers designed components independently.

Examples include:

A loading arm pedestal interferes with pump skid piping.

Electrical conduit routes conflict with structural supports.

Instrument cable lengths differ from field conditions.

Anchor bolt patterns require modification after fabrication.

PLC communication protocols differ.

Structural platforms block maintenance access.

None of these issues result from poor engineering.

They result from fragmented engineering.

The Hidden Costs Rarely Appear on Equipment Quotes

Owners understandably compare equipment pricing.

What is often absent from bid comparisons are costs such as:

- Engineering coordination
- Additional project management
- Multiple drawing reviews
- Vendor meetings
- Freight from multiple facilities
- Field modifications
- Construction delays
- Contractor standby time
- Startup troubleshooting
- Schedule extensions

Each cost may appear relatively small.

Collectively, they can exceed the difference between competing equipment quotations.

Where Integration Changes the Economics

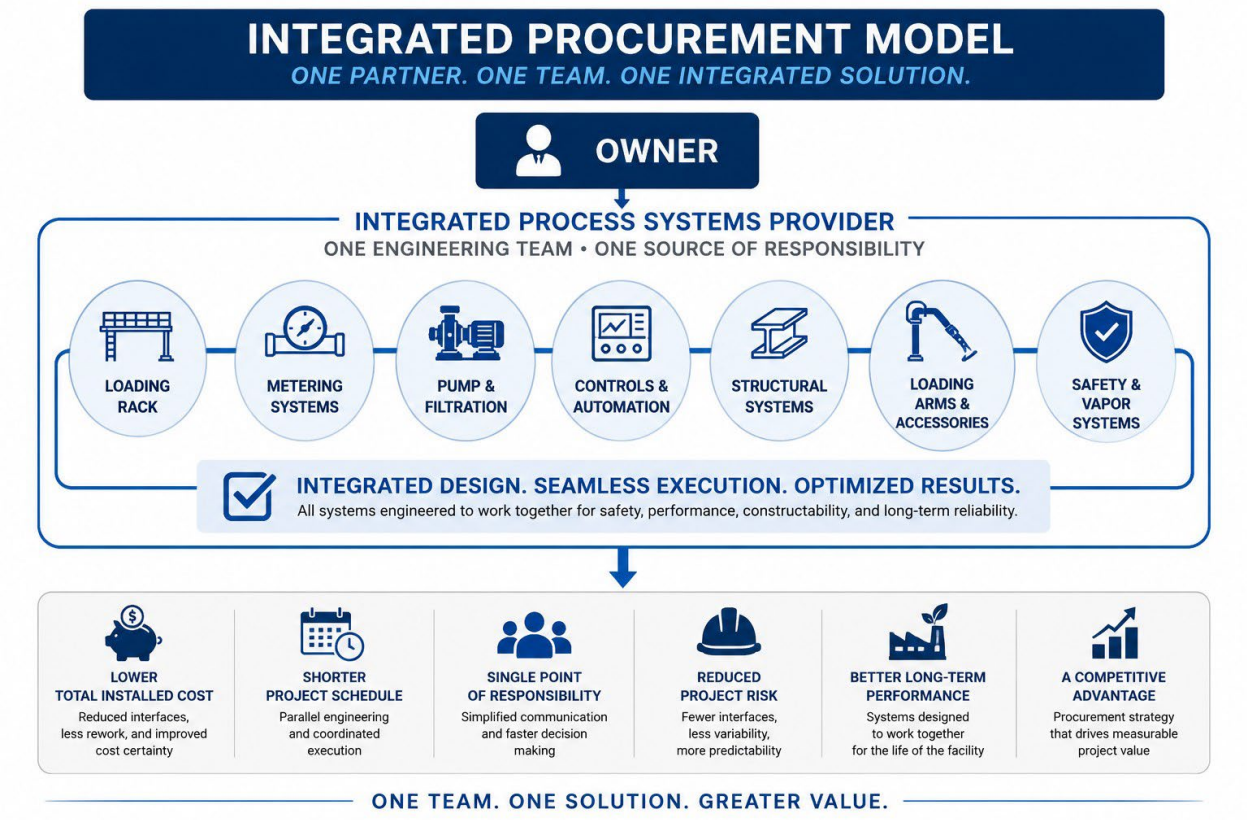
When one engineering organization develops the loading rack together with the process equipment, many project interfaces simply disappear.

Rather than coordinating multiple vendors, a single engineering team determines:

- Pump locations
- Structural elevations
- Loading arm reach
- Gangway placement
- Instrument locations
- Pipe routing

- Cable routing
- Maintenance clearances
- Safety access
- Future expansion

Instead of optimizing individual equipment packages, the design team optimizes the complete facility.



EXECUTIVE INSIGHT 04

The objective is not to purchase the least expensive loading rack.

The objective is to deliver the **lowest total installed cost** while improving safety, simplifying construction, and reducing long-term operating complexity.

That distinction fundamentally changes how owners evaluate suppliers.

About the Author

S&S Technical

S&S Technical is an engineering and manufacturing company specializing in fully integrated process systems for the energy, chemical, petrochemical, renewable fuels, industrial gas, and bulk liquid handling industries.

Rather than focusing on a single product category, S&S Technical engineers complete process solutions that combine mechanical systems, structural components, instrumentation, controls, and safety equipment into fully integrated operating facilities.

Core capabilities include:

- Custody transfer metering systems
- Truck and rail loading & unloading systems
- Pump and filtration skids
- Compressor packages
- Heat exchanger systems
- Additive injection and blending systems
- Process modules and packaged skids
- Loading racks and access platforms
- Fall protection systems
- Loading arms and transfer equipment
- Vapor recovery systems
- Complete terminal integration

By approaching projects as complete engineered systems rather than individual equipment packages, S&S Technical helps owners reduce engineering interfaces, simplify procurement, improve constructability, and optimize total installed cost.

The company's engineering team supports projects ranging from individual loading stations to fully integrated truck terminals, rail terminals, pipeline facilities, chemical plants, refineries, and export terminals throughout North America.

Why This Whitepaper Was Written

Industrial projects continue to grow in complexity.

As facilities evolve, procurement strategies must evolve as well.

This paper was developed to encourage owners, engineers, EPC firms, and procurement professionals to evaluate loading facilities from a systems perspective rather than as a collection of individual equipment purchases.

While traditional loading rack suppliers remain in the industry and produce only one specialty item that is no longer unique and can be purchased from multiple providers, that being access gangways and fall protection, they fall short in todays project environment with no other capabilities beyond steel fabrication that can be replicated locally, for less cost. Integrated process system providers offer an additional procurement model that may improve project economics, reduce engineering complexity, and simplify execution on many projects.

The intent of this publication is not to advocate a single supplier, but rather to encourage a broader evaluation of procurement strategies that maximize overall project value.

Continuing the Conversation

Every project has unique operational requirements, schedules, budgets, and execution strategies.

If your organization is evaluating a truck loading facility, rail terminal, custody transfer system, process skid, or complete integrated loading package, S&S Technical welcomes the opportunity to discuss potential approaches and share engineering insights developed through years of experience delivering complex industrial systems.

Whether S&S ultimately participates in your project or not, we hope the concepts presented in this paper contribute to more informed procurement decisions and more successful project outcomes.

Contact

S&S Technical, Inc.

Engineering • Fabrication • Integration

www.skidsolutions.com

info@skidsolutions.com

+1 (678) 867-7024

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