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WHITEPAPER

How to build an agile liquid bulk supply chain

[INTRODUCTION]

Why make your liquid bulk supply chain more agile?

How ready is your liquid bulk supply chain for sudden geopolitical shifts, regulatory upheavals, or market volatility—and how quickly could you adapt if disruption strikes tomorrow?

The global landscape for liquid bulk logistics—particularly oil and gas—is undergoing fundamental changes. The relatively stable, predictable era of globalization and rules-based trade is giving way to a more fragmented, competitive environment. Protectionism, geopolitical realignments, as well as regulatory pressures linked to the energy transition are reshaping the industry.

For companies managing liquid bulk supply chains, this new reality demands a critical re-examination of existing logistics setups and contingency plans. They may need to prepare for disruption of well-established supply routes, or for the impact of tariffs or economic sanctions. Geopolitical instability and its fallout—including armed conflicts and hybrid warfare tactics—can instantly disrupt critical infrastructure such as terminals, pipelines, or shipping lanes.

Yet despite these challenges, disruption also creates opportunities. **Companies capable of swiftly adapting their supply chains can capitalize on (temporary) market advantages—**securing new contracts abandoned by less agile competitors or leveraging alternative trade routes to mitigate disruptions.

Besides, building a more agile supply chain is not only crucial to manage the risk of disruption —it's also a way to remain competitive at a time when increased competition and market volatility can squeeze margins and profitability. For example, intensified competition in Asia-Pacific and Middle Eastern regions have compressed margins for incumbent players as new entrants leverage geographic advantages and lower cost structures to gain market share.

Against this backdrop, the ability to quickly adjust, transform or even set up new supply chains is an invaluable asset. But where to start?

Recent events that shook global liquid bulk supply chains

- **Russia-Ukraine Conflict (2022–2024):** Infrastructure damage and sanctions disrupted crude oil, oil products and natural gas flows from Russia, forcing rapid rerouting of cargoes globally.
- **Panama Canal Drought (2024):** Record-low water levels severely restricted vessel drafts, forcing significant rerouting of oil tankers and LNG carriers.
- **EU Degassing Ban (2024):** New environmental regulations prohibited degassing at European ports, requiring substantial operational adjustments for tanker operators.
- **Red Sea Tensions (2023-2024):** Repeated threats of blockade in this strategic chokepoint led global traders to seek costly alternative routes around Africa's Cape of Good Hope.

[CHAPTER 2]

What to be prepared for

Could your supply chain quickly adapt if a key terminal suddenly became unavailable, or if regulatory changes forced immediate adjustments to your operations? And do you know which scenarios should be prioritized to ensure your logistical agility?

There are numerous scenarios that could require rapid adjustments to your liquid bulk supply chain. Below are six key categories of scenarios that product owners and logistics planners must anticipate and prepare for:

Delivery issues

These include situations where product availability is limited, or when ullage—the available space in storage tanks—is insufficient. Other delivery-related disruptions can arise from inadequate loading or discharge capacities at terminals, unplanned maintenance outages, payment disputes causing delays, or harbor congestion exacerbated by geopolitical tensions.

Transport capacity constraints

Imbalances between supply and demand for vessels or storage facilities can severely limit transport options. Staffing shortages at terminals or onboard vessels, as well as terminal congestion resulting from infrastructural bottlenecks, can further restrict available capacity and delay cargo movements.

Information gaps and inaccuracies

Incomplete or incorrect information—such as inaccurate data on waterway conditions affecting vessel draft restrictions—can cause costly operational delays. Communication breakdowns between supply chain partners, unexpected route blockages, and insufficient data regarding alternative routing options can compound logistical inefficiencies.

Human errors

Mistakes made by individuals within the supply chain—such as inaccurate cargo calculations, administrative oversights, collisions or accidents involving vessels or terminals—can disrupt operations significantly. Last-minute changes to orders or unexpected new requirements frequently amplify these risks.

Legislative and regulatory shifts

New regulations aimed at environmental protection (e.g., degassing bans in ports), stricter quality standards for exported products, or rapidly imposed sanctions regimes can abruptly alter trade flows. Companies must quickly adapt their logistical setups to remain compliant and operationally viable.

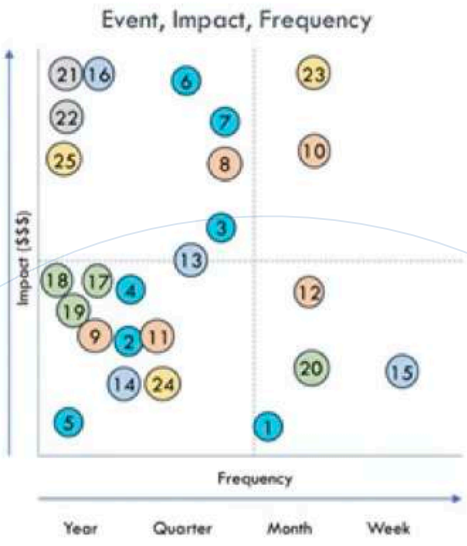
Product-specific issues

Quality deviations discovered upon loading or discharging cargoes can lead to rejections and costly delays. Quantity discrepancies between expected and actual cargo volumes—or even situations where incorrect products are loaded due to human error—can similarly disrupt logistical processes.

Prioritizing agility improvements

Clearly, not all scenarios carry equal weight. Some occur frequently but have relatively minor impacts on overall operations. Others occur less often but have severe consequences. Applying a frequency-impact matrix helps prioritize scenarios effectively:

Scenarios that cause supply chain issues (point-to-point logistics)



1.	Product availability	DELIVERY ISSUES
2.	Ullage	
3.	Load/discharge capacity	
4.	Unplanned maintenance	
5.	Payment issues	
6.	Geopolitical challenges	
7.	Harbour congestion	
8.	Loadable issues	AVAILABILITY TRANSPORT MODE
9.	Incorrect date (eg. Load/dis documentation)	
10.	Imbalance supply/demand (transport cap.)	
11.	Staffing issues	
12.	Terminal congestion	
13.	Water level predictions	INFORMATION FLOW
14.	Communication issues	
15.	Inefficient logistical process	
16.	Blockades and alternative routing	
17.	Inaccurate calculations	HUMAN FACTOR
18.	Collisions/accidents	
19.	Admin errors	
20.	Last minute movements (Friday afternoon special)	
21.	Legislation (eg. degassing)	LEGISLATION
22.	Compliance (sanctions, export product quality requirements, etc.)	
23.	Quality	PRODUCT
24.	Quantity	
25.	Wrong product	

High impact, low frequency

These include responding to scenarios with a mid-to long-term impact, such as legislative or regulatory changes and geopolitical challenges. Other scenarios can occur suddenly and require a swift response, such as blocked trade routes, harbour congestion, limited load/discharge capacity and other loadable issues such as draft restrictions.

Tackling these scenarios typically requires a project-based approach and structural changes to existing supply chains.

High impact, high frequency

These are the scenarios that are typically part of day-to-day operations, and place planners under pressure to come up with swift, effective mitigation measures. Such scenarios include:

- quality deviations discovered during loading/unloading operations;
- imbalances in transport capacity availability;
- terminal congestion issues;
- inefficiencies caused by insufficient logistical information sharing among parties involved;
- last-minute cargo movements;
- limited product availability.

How to respond

While these scenarios vary widely in scale, nature and impact, they have one thing in common: addressing them successfully requires reliable, timely market data, to enable swift and informed decision-making.

Point-to-Point vs Integrated Logistics Models

In a point-to-point logistics model, each node (terminal operator, vessel owner/operator) independently manages their segment of the supply chain. Conversely, an integrated logistics model entrusts a single entity with end-to-end management across all nodes. Today's liquid bulk industry predominantly uses point-to-point logistics models due to complexity and cost considerations; however, integrated models face even greater challenges—necessitating especially robust contingency planning.

[CHAPTER 3]

How to prepare for high-impact scenarios

In the previous chapter, we identified scenarios whose impact and frequency underline the need for a more agile supply chain. But how can you practically address these challenges and seize opportunities as they arise?

To build agility into your liquid bulk supply chain, you must take targeted measures that minimize risks and provide flexibility. Below are four key categories of actionable strategies that can help you achieve greater adaptability and responsiveness:

1. Increase flexibility by ensuring access to additional capacity

TA flexible supply chain requires quick access to additional production, storage, or transport capacity when unexpected situations arise. Establishing relationships with backup suppliers, storage terminals, or vessel operators and creating contractual arrangements upfront that enable flexibility and optionality allows you to swiftly respond to disruptions or sudden market opportunities without lengthy negotiations or delays. This proactive approach ensures your operations remain resilient even under rapidly changing conditions.

2. Streamline operations through improved planning and coordination

Effective coordination between all parties involved—such as suppliers, terminals, vessel operators, and customers—is essential for smooth logistical operations. By implementing shared planning tools and clear communication protocols, you can significantly reduce delays and inefficiencies. Real-time information sharing about vessel ETAs, involved parties, berth availability, and operational status updates ensures everyone remains aligned and informed.

3. Limit preventable human errors

Human errors—such as incorrect cargo calculations, administrative oversights, or compliance mistakes—can lead to costly disruptions. Implementing robust planning software that automatically flags potential issues (e.g., terminal restrictions or compliance requirements) helps planners avoid common pitfalls. Regular training programs and clear operational guidelines further reduce the risk of human error disrupting your supply chain.

4. Increase safety stock

Maintaining strategic inventory buffers at critical locations provides an effective safeguard against unexpected disruptions in product availability or delivery delays. However, this measure is typically expensive due to storage costs and tied-up capital. Thus, safety stock should be reserved for high-risk products or markets where disruptions could severely impact operations or profitability.

Regardless of which combination of these measures you choose to implement, their effectiveness ultimately depends on having timely access to accurate market intelligence and operational data:

- **Increasing flexibility:** Requires reliable data on available logistical partners, their capabilities, current availability of vessels or storage capacities, as well as up-to-date pricing benchmarks for comparison.
- **Streamlining operations:** Depends on detailed real-time information regarding routing options, capacity availability, operational status of facilities and vessels (including accurate ETAs), and prompt notifications about any emerging operational issues or delays.
- **Limiting errors:** Planners need access to accurate facility capability data (such as loading/discharge rates, transport connections or draft restrictions) and compliance requirements to proactively avoid logistical bottlenecks.
- **Increasing safety stock:** Demands precise inventory tracking combined with reliable forecasting tools that assess replenishment lead times against anticipated demand fluctuations.

By combining targeted measures with comprehensive data-driven insights, companies managing liquid bulk supply chains can significantly enhance their agility—transforming potential disruptions into opportunities for competitive advantage.

[CHAPTER 4]

The quest for data

Reliable data underpins every agile supply chain strategy—but how efficiently can your team access it today?

When looking to identify (new) logistical partners or facilities, general internet searches may be a natural starting point, supplemented by direct requests for quotes from current partners or potential partners found in online industry resources and platforms. Specialized online websites for tracking vessels or cargo movements are also popular tools among industry planners. Additionally, many professionals can leverage extensive personal networks with valuable industry contacts, built up over many years.

However valuable these individual data sources may be, they also carry significant drawbacks. General internet searches and requests for quotes can be extremely time-consuming, often requiring multiple follow-ups and manual verification. Additionally, information gathered in this way runs a high risk of being outdated or incomplete, as market conditions can change rapidly and online data is not always regularly updated. Unfortunately, there is also a real risk of fraudulent schemes masquerading as legitimate logistical operations.

Specialized vessel-tracking or cargo-tracking databases, while useful, are limited in scope and may also contain inaccuracies or gaps, particularly if they rely heavily on automated data feeds without sufficient manual verification. Finally, relying on personal networks and industry contacts—though valuable—can introduce bias or limit your perspective, potentially excluding better logistical options that fall outside your existing relationships.

Ideally, planners would access all necessary data consolidated within a single comprehensive platform—combining publicly available market intelligence with verified firsthand insights from terminal operators globally—to streamline decision-making processes efficiently.

Insights Global's TankTerminals platform exemplifies this ideal solution. Insights Global's TankTerminals platform aggregates comprehensive global terminal data updated continuously by dedicated industry specialists. Covering over 2,400 ports and more than 13.000 terminals globally, it provides verified insights into capacity availability, operational status updates, pricing benchmarks—and facilitates swift partner identification crucial for agile logistical planning decisions.

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Unlock the full potential of your supply chain with TankTerminals.com

Are you ready to take your liquid bulk supply chain to the next level? **TankTerminals.com** can provide you with real-time, verified global terminal data that helps you make quick, informed decisions—ensuring you're prepared for any disruption.

Request your personalized demo today! Our experts will walk you through a customized demonstration tailored to your specific needs, showcasing how **TankTerminals.com** can enhance your supply chain's agility and resilience.

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