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Chemical Logistics

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A Special Supplement
from *Inbound Logistics*
and *Chemical Week*

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Outlook & Opportunities in Chemical Logistics

Today: getting goods to and from the warehouse; tomorrow: where to put the warehouse?

By Gregory DL Morris

From the outside, the chemical logistics business looks like undiscovered country, ripe with opportunity for service providers. Chemical producers agree that those opportunities exist, but they are not the low-hanging fruit they appear to be.

"A lot of service providers are trying to enter the chemical logistics market," says Henry Ward, global director of transportation safety and security for Dow Chemical, based in Midland, Mich. "Generally, we negotiate our own contracts, and look to third-party logistics providers (3PLs) to execute. Increased visibility is the real need in the market, and service providers can help pull that data together. That is the direction we are headed."

The story is similar at another of North America's largest producers. "Third-party logistics has certainly grown in the chemical industry, but with mixed results," says Peter Masterman, vice president of logistics and customer service at Nova Chemicals in Calgary, Canada. "We

look at distribution as a core competency – transit costs and service are critical to our business. Look at the margin on one pound of polymer, for example. We drive inventory pretty hard."

Nova does, however, use specialized outside logistics expertise in some cases. "We use 3PLs for freight forwarding, brokerage, and customs. We are particularly interested in 3PLs that can help in areas such as international shipments to places where we do not already have depth."

The pace of new entrants into the chemical 3PL market has slowed lately, says Kelly Elizardo, director of transportation and logistics assets at Philadelphia-based Sunoco. "We still get a steady drumbeat of 3PLs interested in our business, but it has declined a little since the initial rush," she explains. "3PLs now understand that unlike other sectors, the chemical industry does a lot of best-practices sharing. Logistics is a core competency in this business, and there is a constant internal challenge in the industry to improve."

Sunoco has not used 3PLs to the extent other shippers have, Elizardo says. Mostly the opportunities for outsourcing have been in truck tendering and dispatching, and railcar tracking and tracing.

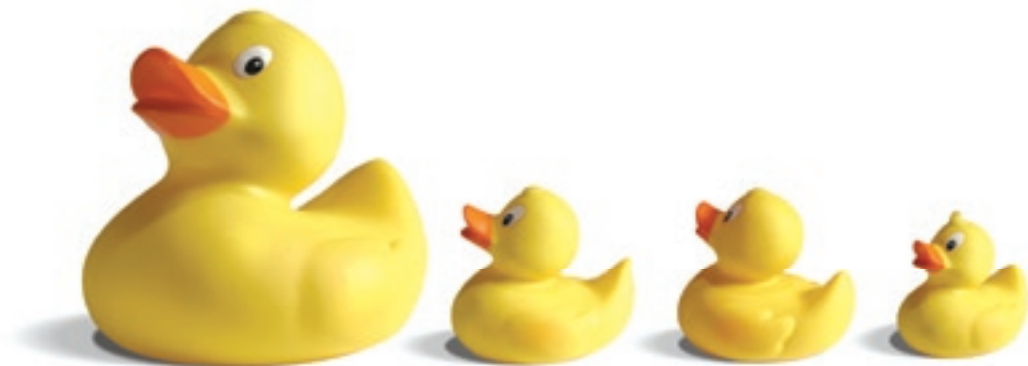
"Shipment visibility is important," she says. "We know where every car is inside the fence, and we understand that the national transportation infrastructure is a challenge for all carriers and service providers. That is why we want to be close partners with our vendors. Having safe, reliable, and environmentally sound operations inside and outside the plant is key."

Nova operates along the same lines. "Responsible Care' is a long-standing ethic in this industry," says Masterman. "Now that we are looking at the entire supply chain as a value chain, Responsible Care makes our thinking outside the fence line more holistic. Responsible Care provides a risk-based approach, and we use those selection criteria when we have the ability to choose a carrier, terminal, or other logistics provider." (See next feature for more information on Responsible Care.)

Masterman sees better service opportunities in areas such as tracking and tracing, invoice and payment service, and scheduling.

"We occasionally bring contractors to our sites, but it is more common to have an onsite 3PL that physically operates packaging and shipping in Europe than in North America," he says.

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chemical producers is the goal for supply chain solutions provider Exel, Columbus, Ohio.

"Seventy-five to 80 percent of our chemical customers are Tier 1 producers – the big household names," says Gary Williams, president of the chemical and industrial sectors for Exel. "But we do not manage the whole supply chain – end to end – for any one company yet. We have the capacity to do so, but we have not yet been asked to provide that service. We are, however, in discussion with several customers to do it."

Until such time, there are plenty of incremental openings in chemical logistics, Williams says.

"Opportunities exist if you understand what services to offer," he notes. "Producers are cleaning up their portfolios. In some cases, we have taken over 100 percent of processing for a customer – that means grinding, additives, and packaging or bulk shipping. We may need to use dedicated lines for this service; other times we can spread the cost of assets over several customers."

For service providers, the essential fact to remember is that the chemicals industry is "a mature business with the same competencies," says Mark Rourke, vice president and general manager of transportation management at Schneider Logistics, Green Bay, Wisc. "3PLs must consider the opportunities. Are we helping chemical companies think about the next five years rather than the next five days? We always think of end-to-end total costs, not just the dollar costs of transportation."

Some technology and techniques – such as vendor-managed inventory and RFID – popular in discrete-goods logistics are making their way into chemical logistics. "But companies have to think long-term," says Rourke. "While you are concerned today with getting goods to or from the warehouse, you also have to be thinking about the best place to locate the warehouse." **CL**

Chemical Producers Put New Emphasis on Logistics Safety and Security

Responsible Care becomes the common ground for shippers and service providers.

By Gregory DL Morris

Enhancements to chemical producers' self-imposed mandates for product safety and security in commerce are underway across North America. Both the American Chemistry Council (ACC) and the Canadian Chemical Producers' Association (CCPA) are broadening their transportation and distribution requirements under the Responsible Care codes of management practice.

Chemical production responds well to economies of scale, so logistics is an essential part of the industry. In 2004, the latest year for which complete statistics are available, \$516.2 billion of chemicals were produced in the United States, and cost \$33.2 billion to transport from producers to users. Chemicals are also among

the United States' and Canada's top three goods exports each year. Bilateral chemical trade is considerable, and the United States is also an important worldwide chemical exporter.

"In 2002, chemical companies placed heavier emphasis on managing products outside the fence line," says Debra Phillips, managing director of Responsible Care for Arlington, Va.-based ACC. Most importantly, the industry put in place a process for qualifying carriers, distributors, and other service providers on Responsible Care standards. The qualifications are scheduled to be completed between 2005 and 2007.

The Responsible Care codes of management for process safety, health, and environmental compliance were first developed by Ottawa-based CCPA in 1978. The ACC quickly adopted them, and both organizations have continued to expand and adapt the codes. ACC developed Transportation Community Awareness and Emergency Response (TransCAER)



IN RAIL WE TRUST: Chemical producers spent \$33.2 billion transporting chemicals in 2004, with many shipments – due to their hazardous nature – sent via rail. All North American Class I railroads are major chemical haulers.



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in 1985, which was soon adopted by CCPA. The U.S. codes of management practice have an explicit product stewardship code, and CCPA developed specific product stewardship guidelines at the end of 2004.

ACC encourages all chemicals service providers to become full-fledged Responsible Care partners, adopting the complete codes of practice. All Class I railroads in North America are major chemical haulers, and all are partners. More than two dozen tank-truck carriers are also partners.

Carriers and logistics providers that are not Responsible Care partners are usually audited by a third party using criteria established by ACC. The evaluation alone does not qualify a provider as having proper practices; each shipper analyzes the results to decide on its own wheth-

er or not to use them. Some large shippers also conduct their own proprietary audits. "Safety, reliability, and environmentally sound operations are the

Enhancements to chemical producers' self-imposed product safety and security mandates are underway across North America.

tenets of our business inside and outside the fence line," says Kelly Elizardo, director of transportation and logistics at Sunoco. "Those subjects are the first discussion we have with any carrier or 3PL, and it is an easy step if they are involved

in Responsible Care."

Together with a global product strategy announced at an international meeting of national chemical industry associations in Dubai in February, the new Responsible Care codes "redefine the relationship producers have with distribution in all aspects of the value chain," says Brian Wastle, vice president for Responsible Care at CCPA. "Up to now, product stewardship has been about risk management, not about risk reduction. Now the emphasis is on finding safer alternatives."

This is where distribution and logistics companies play an important role. Reducing the distances shipments travel, the amount of handling that occurs, and the number of people and steps involved in chemical logistics reduces both risks and costs, Wastle says.

Top 10 Practices for Shipping Chemicals by Rail

Whether you are a chemical shipper, carrier, or service provider, safety is crucial. Use these 10 tips to ensure safe rail shipping.

1 Develop and implement a securement policy that includes pre-loading inspections, post-loading inspections, and a corresponding safety checklist.

■ Pay special attention to ensure that railcars are not overloaded, especially for hazardous material shipments.

2 Inspect valves/domes for tightness – this is a leading cause of leaks/spills in rail transportation incidents.

■ After loading, leak-test the car by applying at least 10 psig of pressure over the maximum estimated transportation pressure. Check all valves, packing gland nuts, closures and flanges using a leak detection solution or ultrasonic instrument. After completing the leak test, release or reduce pressure.

■ If a pressure test is impractical or unsafe, the railcar in question

should be held and reinspected after 24 hours. Valves and fittings should be re-tightened as needed.

3 Review shipping papers to ensure adequate data.

■ Promote Electronic Data Interchange for all shipments.

4 Ensure that proper placarding is maintained for all railcars.

■ Utilize recto-reflective placards, a requirement for bulk consignments.

■ Shippers should eliminate using paper placards whenever possible.

5 Ensure that the Emergency Response Plan is correct and updated for plant sites and transportation-related releases.

■ Conduct an annual drill of the

Emergency Response Plan.

■ Shippers must show proper ERP number and associated telephone number on dangerous goods.

■ Ensure that emergency contacts and telephone numbers for the railroad and plant site are correct and updated regularly.

6 Implement these key training programs:

■ All railroad personnel entering the plant site should be properly trained and/or receive orientation, especially for emergency actions.

■ Establish, document, communicate, and implement a company-wide tank car securement training program.

■ Establish, document, train, and implement a procedure for tank car customers to report poor securement, hard-to-operate valves, and other fitting problems.

■ Establish, document, train,

and implement company-wide preventive maintenance practices for tank cars.

7 Ensure that all rail crossings within the plant site are properly marked with warning signs.

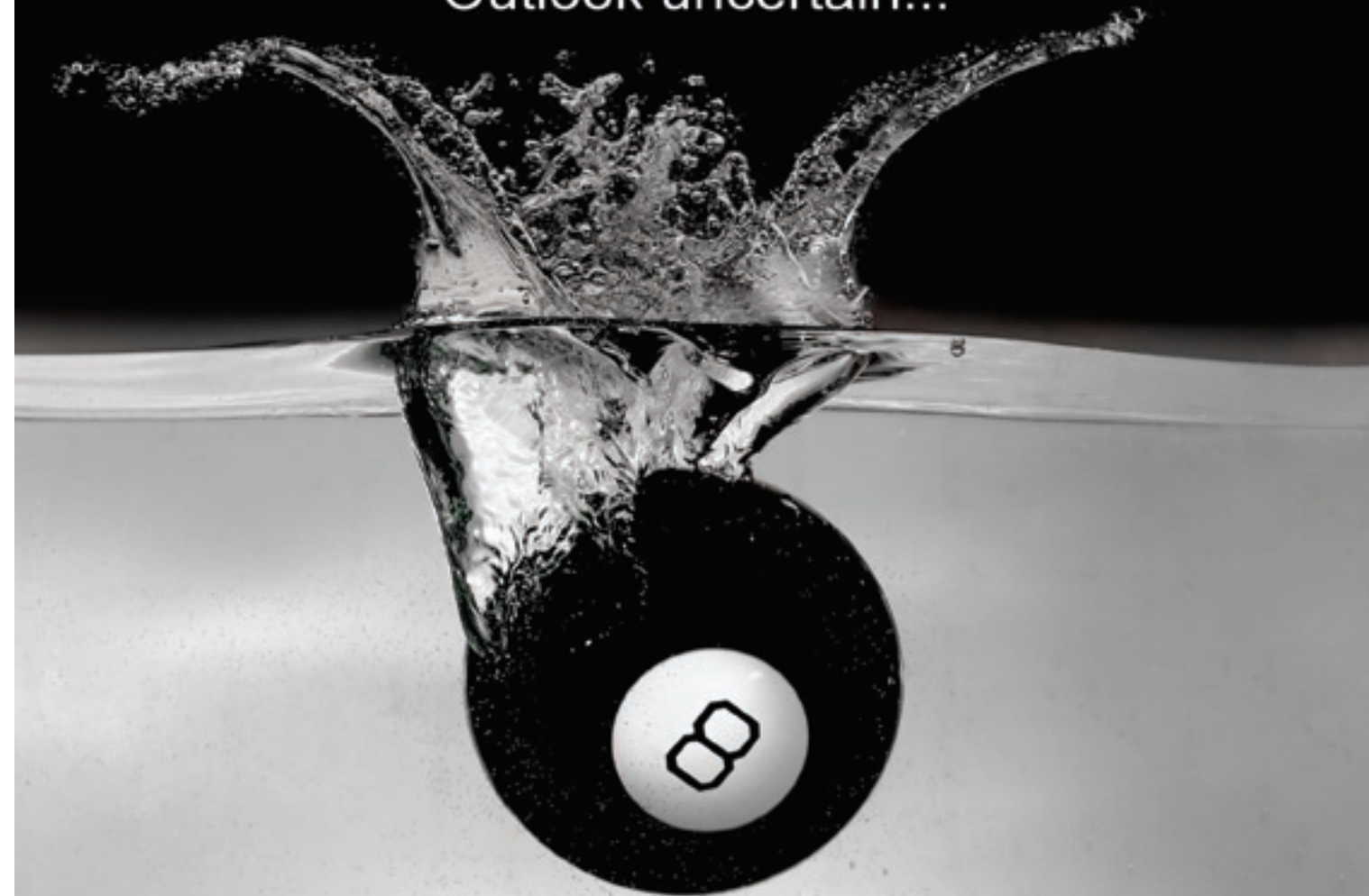
8 Check to be sure rail lines are clear, switches are aligned properly, and car brakes are released before moving cars.

9 Have plant personnel closely observe rail crews when they are operating within the plant site to assure plant and rail safety is maintained.

10 Have a documented routine process for providing feedback to rail carriers.

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TAKING RESPONSIBILITY: Safety and security are crucial to the chemical industry. Many shippers require their carriers and 3PLs to adhere to the Responsible Care code of management practices for process safety, health, and environmental compliance.

“Will a service provider automatically get more business from being a Responsible Care partner or from having comparable, verifiable practices? No. Will it make it a better company? Yes. And better companies get more business,” he says.

Nevertheless, carrier acceptance is not universal. “We are a Responsible Care partner carrier because we view the codes as consistent with our core values,” says George Grossardt, vice president and general manager of bulk transport at Schneider National, Green Bay, Wisc. “And we plan to remain a partner. But for some carriers it is a business decision. In this capacity-constrained market, shipments will move regardless. It’s hard to criticize small operators who don’t participate in Responsible Care.”

Producers and chemical associations have enhanced their service provider audit program, and some shippers have pledged to give most of their business to partner or complying carriers. Dow Chemical,

for example, has said that by 2008, “every raw material supplier and every logistics service provider must be a Responsible Care company or partner, or have implemented an equivalent program as determined through audits,” says Henry Ward, Dow’s director of transportation safety and security.

These requirements lessen his staff’s supervisory burden, and help service providers.

“We have been focused on the Responsible Care security code, and on the partner program. We’ve put a lot of energy into that,” Ward says. “The bottom line is, we are interested in performance, and Responsible Care is performance in a recognizable and verifiable format.”

The codes also provide a common ground for close relationships between shippers and carriers. Earlier this year, for example, Dow formed a safety and security partnership with its largest rail carrier, Union Pacific (UP). “We are focused

on six key areas: supply chain re-design, next-generation tank cars, improving shipment visibility, strengthening the commitment to TransCAER, overall safety improvements, and hazardous-materials routing,” says Ward.

“Some of these are Dow’s responsibility, some are UP’s and some are joint responsibilities. We know which is which, and we have specific performance objectives,” he adds.

Other chemical companies plan to restrict their service providers to some degree. “Honeywell has committed to using only Responsible Care carriers for its bulk chemicals, and Rohm & Haas will forego its own company audits for partner carriers,” reports ACC’s Phillips.

“We get a lot of inquiries on how to approach Responsible Care,” she adds. “To join Responsible Care, a prospective partner firm has to be sponsored by two ACC member companies. Some members have also sponsored prospective service providers.”

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True Shipper-Logistics Provider Integration Inches Closer to Reality

Service providers are moving inside the fence line and working with shippers' customers.

by Gregory DL Morris

After more than a decade of trying to become the shipping desk for chemical producers, logistics providers can point to many successes, but not quite the ubiquity they hoped for.

And now new challenges are arising. Not even gasoline at \$3-per-gallon can keep U.S. drivers off the highways. Congestion is also an issue for most of the North American rail network, although the regional meltdowns of previous years are now just bad memories.

"Today's rail network movement is pretty good," says Peter Masterman, vice president of logistics and customer service at Nova Chemicals, based in Calgary, Canada.

"We are able to run more cars across limited infrastructure. The problems we encounter are in the first mile and the last mile, especially getting a specific car to a specific customer," he says. "We are addressing these problems by educating customers about how railroads work. It's not glamorous, and it requires hard work, but it is in everyone's best interest."

UNLOCKING VALUE

Dan Bingeman, assistant vice president of supply chain logistics for the Canadian National Railway, Montreal, disagrees. His parent railroad does not have a congestion problem, he says, adding that thanks to a new routing protocol among roads in the West, cycle

times have improved for chemical shippers' tank cars and hoppers.

For the past few years, Bingeman has been operating a stand-alone 3PL focused on unlocking value in the North American rail infrastructure for chemical producers and logistics managers.

"We offer granular services, starting way back in the supply chain with chemical companies' suppliers, all the way through rail and truck transport procurement. We also handle in-plant logistics for some customers," he says.

Most recently, Bingeman worked with Spanish producer Interquisa, which began base-loading the North American market

expert, to offering a full range of service as we do for Interquisa and PTT," he explains.

"The old rules of thumb on rail and truck transport are being turned on their heads," he adds. "Once you start shining daylight on common practices, shippers find they not only improve performance and cut costs, but actually gain market share because they have more product available and can get it to the right markets."

BECOMING CARRIER-FRIENDLY

On the truck side, operators and 3PLs alike will be cheered to hear Nova's Masterman talk about utilization. "We are definitely trying to

"The old rules of thumb on rail and truck transport are being turned on their heads. Once you shine daylight on common practices, shippers improve performance, cut costs, and gain market share because they have more product available."

— Dan Bingeman, Canadian National Railway

by shipping purified terephthalic acid, a precursor for PET resin, in advance of building a plant in Montreal.

"We handled imports and logistics for Interquisa in North America," says Bingeman. "We were also on site for the plant construction, consulting on logistics. As the plant became operational, we shifted from imports to domestic production."

Bingeman's group now also handles logistics for one of Interquisa's customers, PTT Poly Canada.

"We have 47 active clients. Our role with those clients spans from one person acting as an on-site rail

be more carrier friendly. It used to be okay for a truck to sit and wait at our front gate for 20 minutes, then wait at the loading rack for 20 minutes, then wait at the scale for 20 minutes," he says. "But that's one hour lost. If we as shippers don't respect carriers' utilization, well, they have choices, too. It is the same situation at the ports."

Truck utilization has been thrown into stark relief by the growing driver shortage and restrictions on hours of service.

"For 20 years we received reduced rates from carriers, but now we are on the other side," says George Grossardt, vice president

and general manager of bulk transport at Schneider National, based in Green Bay, Wisc. "We have to make hard decisions on driver demographics. We still use predominantly inexperienced drivers and train them."

DISTRIBUTOR CONVERGENCE

The additional variable in the chemical logistics equation is the presence of distribution companies. Some, such as Ashland of Dublin, Ohio, are producers and distributors. Others, such as ChemCentral of Bedford Park, Ill., are pure distributors.

"There is some convergence between the services 3PLs perform and what we do," says Mark Rost, director of purchasing, ChemCentral. His post was created this year to coordinate the company's four regional purchasing managers.

"Producers have made us look at

every facility and examine whether we are operating at full capacity. Often we have found unused or underused assets," Rost says. "We are also looking at facilities together with producers, answering questions such as, should we both have a tank of the same product within 100 miles of each other?"

"Sometimes we are approached by suppliers, but we have also approached them," he adds. "In some cases, we buy from them in drums. But we are good at drumming. This leads us to think, can we buy in bulk and drum for our customers? Maybe we can drum for their other customers, too?"

Ashland also sees convergence between chemical 3PLs and distributors.

"We consider ourselves a 3PL," says Michael J. Shannon, executive vice president, global supply chain for Ashland, which is not only a

chemical producer, but also a large fleet operator, with 450 tractors and almost 1,000 trailers.

"We use 3PLs in areas where we cannot add value, such as small quantity packaged goods," says Shannon. "And some of our suppliers use us as a third-party logistics provider. Right now, producers and distributors are thinking about being in the right markets, and the number of operations in those markets."

THE FINAL TEST

"The final test for 3PLs of any size is: what do they offer for shippers, and what do they offer for carriers?" says Schneider's Grossardt. "Some 3PLs have been successful creating new models for other industry sectors.

"But it will be more difficult in bulk chemicals," he notes. "You can't just run chemical products through crossdocks."

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Good Chemistry

In a volatile industry, chemical companies tackle multiple logistics challenges.

by John Edwards

For chemical company Hercules, logistics management has become a task worthy of its namesake. "The industry is changing so quickly," says Bill Adams, Americas logistics director for Wilmington, Del.-based Hercules, a \$2-billion company that produces an array of chemicals for paper, paint, and textile manufacturers.

Chemical companies such as Hercules already bear high logistics costs due to the nature of their products, which are typically heavy, bulky, difficult to store, and hazardous. Now these firms face additional challenges, including skyrocketing energy prices, new

regulations, and a chronic shortage of suitable carriers.

Interestingly, logistics costs have begun to outweigh manufacturing expenses for chemical companies, says Beth Enslow, a supply chain analyst with Boston-based research firm Aberdeen Group. "Chemical companies realize logistics may be the next 'spend bucket' in their company, and they need to gain control to make sure they remain cost-competitive," she explains.

GOOD TIMES AND CHALLENGES

Despite the many challenges, these are actually good times for the chemical industry. "U.S. chemical industry growth was relatively stagnant from 1997 to 2003, and it boomed in 2004," says Balaji B. Capaloor, senior chemical industry research analyst at Frost & Sullivan, a business research firm located in San Antonio, Texas.

Global chemical trading grew by 67 percent between 1999 and 2004, reports Capaloor. Meanwhile, the industry has become more global, with the North American market increasingly relying on chemical imports, primarily from Asia.

As their market expands and shifts focus, chemical companies face problems that are unique to their field. "The chemical industry is highly regulated, plus their transportation mix is different than most other industries. They have a higher percentage of rail and ocean shipments," says Enslow.

"We ship products via every freight mode – rail, barge, ocean container, bulk, air, pipeline, and truck," says Tom Schick, senior distribution director of the American Chemical Council in Arlington, Va.

The growing diversity of modes and destinations means new supply chain and security challenges

for chemical companies. "As more of the industry's customers move manufacturing abroad, chemical firms have to handle a greater number of cross-border shipments, and their inherent security issues," says Enslow.

Increased global sourcing is one reason Hercules joined the U.S. government's Customs-Trade Partnership Against Terrorism (C-TPAT).

C-TPAT, which began in 2002, is a voluntary government-business initiative that aims to strengthen supply chain and border security. Through the project, Customs and Border Protection asks importers, carriers, brokers, warehouse operators, and manufacturers to ensure the integrity of their security practices, and to communicate security guidelines to business partners within the supply chain.

"We are impressed with the way the partnership works," says Adams. "Faster import clearance at ports and borders is the immediate benefit of membership, but C-TPAT also gives importers a structured process to evaluate risks across the supply chain and to proactively upgrade standards."

TRUCKING ON

Hercules relies on motor freight carriers to get products to its customers. But access to carriers has been compromised in recent years by factors ranging from stricter government regulations to rising costs and even natural calamities.

And Hercules, like its competitors, felt the impact of tighter U.S. Department of Transportation (DOT) Hours-of-Service rules in 2004 that limited the amount of time drivers could spend on the road. Chemical firms and their trucking partners have long struggled to find skilled and certified drivers to haul their cargo, and the DOT's new rules made a difficult situation more challenging.

"The government's action created an almost instant driver

shortage, because shipping volumes were cresting at the same time," explains Adams.

Hercules reacted by working with its third-party logistics provider, Danbury, Conn.-based Odyssey Logistics & Technology, to widen its trucking carrier mix.

Most shippers, including Hercules, have adjusted to carrier scheduling challenges through improved planning and lead times, and by rebalancing carrier-shipping lane matchups. But the situation continues to be somewhat fragile, notes Adams.

"Truckload package freight is one mode where we still see lingering problems," he says. "If you try

New dynamics in the transportation market have forced chemical companies to reexamine their logistics infrastructure. For most, 3PLs are the wave of the future.

to buy in the spot market to cover these loads, it is common to experience lower on-time pickup rates."

The tighter transportation market has resulted in new cost pressures and less flexibility among carriers to meet short-notice demand. "Chemical companies can still get competitive rates, preferred treatment, and good service, but the market is not as flexible as it used to be," says Adams.

Like many other U.S. chemical companies, Richmond, Va.-based Albemarle, which supplies specialty chemicals for water treatment, oil-field services, and high-tech parts cleaning, uses rail for long-distance shipments to ports and domestic customers.

"Because of safety factors,

we prefer shipping via rail," says Barbara Little, the company's vice president, government relations. "We transport chlorine and other chemicals; those shipments shouldn't travel on the nation's highways and byways."

HITTING THE RAILS

Unfortunately, the chemical industry's dependence on rail transportation, and the limited number of rail carriers in any particular geographic area, has led to a distorted rail market. The situation is exacerbated by the fact that chemical plants are often located in out-of-the-way places close to raw material sources.

"Inherently, rail shippers end up being captive to one rail line," says Little. "Nearly 60 percent of U.S. chemical companies are in that situation."

The railroads' upper hand has led to a certain amount of customer frustration, according to Little. "We sent one shipment from our plant in South Carolina to Houston," she recalls. "The direct route is through Louisiana, but this rail carrier wanted to take the shipment almost to the Canadian border and back again, just to keep it all on its line." The carrier eventually relented.

Chemical companies have little recourse but to bargain with the only rail carrier at their disposal. "If a trucking company gives you high rates or poor service, you can use another provider," says Schick of The American Chemical Council, adding that plenty of choice also exists among barge lines and ocean and air cargo carriers. "But when one railroad is the only way in or out of your plant, you have no alternative."

Another financially important aspect of rail transport is that chemical companies must provide and maintain nearly 100 percent of the rolling stock they use. "The cost of buying or leasing cars falls squarely on the shipper," explains

Schick. "The railroad does not supply rail cars, only the locomotive to power them."

As a result, most chemical companies must manage large numbers of rail cars, including tank cars and covered hopper cars, which are used to move dry chemicals. "That constitutes another cost element, in addition to freight rates and fuel surcharges," Schick says.

A DOUBLE-SHOT OF PAIN

As if trucking and rail headaches aren't bad enough, chemical companies are also dealing with soaring energy costs. While rising oil and natural gas prices increase fuel surcharges for all shippers, the upward energy spiral presents a double shock to chemical manufacturers. That's because chemical companies must pay for petroleum as a key ingredient in a wide range of products, as well as for use in the vehicles that transport their raw and finished materials.

"Any manufacturer that relies on petrochemicals or petrochemical derivatives is feeling cost pressure," says Adams.

Frost & Sullivan's Capaloor concurs. "High crude oil and natural gas prices have increased raw material costs," he says. "They reached an all-time peak in 2005."

Chemical companies have little control over natural gas and energy pricing, however. Worse yet, sudden price hikes can quickly demolish carefully planned production and transportation budgets, while encouraging consumers to conserve their use of chemical products.

"Natural gas, other petroleum products, and the cost and availability of energy are crucial issues to the chemical industry in the United States," explains Schick. "They put pressure on our indus-

try's competitiveness."

Adams knows that pressure all too well. "Like most chemical firms, our raw material expenditures were up significantly last year, due to the cost pressure on petrochemical-based raw materials," he says. "We have to pass these along in our pricing, while at the same time pursue alternate, more cost-effective raw material sources."

"We are aggressively developing new and less costly sources in Eastern Europe and Asia," he adds. But to take advantage of these more distant sources, a company's global logistics processes must be robust and efficient. "Companies



MIXING IT UP: Chemical companies such as Hercules use a variety of modes to safely transport hazmat shipments and maintain cost efficiency amid rising expenses.

with a manual, clumsy process for managing global transportation and inventories can easily wash out the benefits of cheaper material sources," says Adams.

New dynamics in the transportation market are forcing chemical companies to reexamine – and sometimes radically alter – their logistics infrastructure. Prior to 2003, for example, Hercules operated its own transportation group, which managed the company's freight operations and dealt directly with carriers and other transportation service providers.

"But we realized we didn't have the leverage or the technology to

achieve the best overall transportation cost and service values, let alone respond to changes with the agility needed to be competitive," says Adams.

That's when Hercules decided to work with 3PLs. The company turned to Odyssey Logistics & Technology to handle its North American logistics operations, and de Rijke Logistics in the Netherlands to manage its European shipments.

By partnering with a 3PL, Hercules is part of a growing chemical industry trend. These days, most small- to mid-sized chemical companies use some form of outside logistics help. For most chemical producers, 3PLs are the wave of the future, says Adams.

"Major chemical manufacturers may have the critical mass to justify in-house transportation, but for a company our size, using a 3PL makes a lot of sense," he says. "Most importantly, it

frees up resources we'd

prefer to use to enhance the value of our chemical products and services."

TECHNOLOGY SOLUTIONS

All chemical companies, whether or not they outsource logistics, are streamlining operations.

"Companies are synchronizing their transportation assets," says Enslow. "Rather than building a big warehouse, they are going directly from the production line to the rail car or tanker truck, skipping the intermediate storage area."

To better coordinate loading, unloading, and other operations, companies are turning to transportation management systems (TMS) to optimize their transportation networks. TMS products automate key elements of a company's shipping infrastructure, including strategic and operational planning,

network design, transportation execution and monitoring, invoicing, billing, and settlement.

A variety of TMS software vendors, including i2 Technologies, Manugistics/JDA, and Oracle, serve the chemical industry. Atlanta-based RMI offers a rail shipment tracking system for chemical shippers. The tool traces railcars contained in permanently assigned fleets, or rail shipments loaded in "free-running" equipment. It monitors both inbound and outbound rail shipments using car movement information from Class I railroads, and from more than 300 shortline and regional railroads.

SAP targets the industry with a TMS product specifically geared toward chemical producers: SAP for Chemicals. The software is part of the vendor's mySAP customer relationship management suite. "We offer compliance documentation, demand planning, and

supply network planning capabilities for chemical companies," says Marty Etzel, director of chemical solutions marketing for Walldorf, Germany-based SAP.

Chemical companies also use technologies such as RFID and satellite-driven global positioning systems to maximize shipping efficiency and cut costs.

Logistics-oriented technologies help companies in two ways, says Enslow. "These technologies give companies real-time goods visibility, which helps them improve supply chain management and address government regulations and security concerns," she notes.

The other key benefit is improved asset management. "If a company knows where its goods are, or when a tanker car enters its customer's yard, for example, it can automatically be alerted before it has to pay detention charges," Enslow says.

Like all businesses, chemical companies' main goal is to earn profits by selling products and services its customers need. Yet, due to their business' inherently hazardous nature, thinking about safety and security comes naturally to chemical logistics managers.

Hercules, for example, conducts random audits of carrier unloading activity to be sure carriers are performing these tasks safely, says Adams. It can be tempting for chemical companies to turn a blind eye toward carriers that sacrifice safety and security for the ability to offer lower bids, but Adams and his counterparts resist the urge to use carriers that cut corners.

"It is incumbent on chemical shippers to be careful when selecting carriers. We must exercise due diligence to pre-qualify carriers that meet standards and will hold to those standards themselves," he says.

CL

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