

SAFE AT SEA

New technologies are increasing the dependability of shipping while reducing the industry's environmental mark.

BY CHRIS WARREN » ILLUSTRATIONS BY KENT LEECH

GERRY WANG, CEO OF HONG KONG-based **SEASPAN CORP.** (SSW), enthusiastically talks about the indispensable role the shipping industry plays in the efficiencies of the global economy. But few people are aware of that role, says Wang, whose company is an outsource provider of large vessels to logistics companies, which haul goods ranging from clothing to electronics from manufacturing centers in Asia to destinations around the world. "People don't know there's an unsung hero somewhere," he says. "If you walk into a Wal-Mart store and buy a DVD player for \$30, there's a good chance it was carried by one of our ships, and the shipping cost was probably only 50 cents."

The International Maritime Organization reports that more than 90 percent of global trade is carried in ships. It suggests that, thanks to more open economies and a raft of international trade agreements, total seaborne trade estimates have quadrupled over

the past four decades. According to the United Nations Conference on Trade and Development (UNCTAD), a record 7.11 billion tons of goods were shipped by water in 2005, the most recent year for which statistics are available.

The issues that shipping companies face in keeping supply chains secure and mobile are myriad, say experts. Some are age-old challenges, such as ensuring that cargo is moving as fast as possible, says Rick Kessler, president and CEO of Horizon Services Group, a subsidiary of **HORIZON LINES INC.** (HRZ). "The name of the game is quick customer delivery, turn time and utilization of your assets. You want to maximize that for everyone's benefit," he explains.

Other matters have a more modern patina. For example, concerns over terrorism have led governments and businesses to coordinate port safety. "If you don't have a secure port, you're not going to have commerce. You need to have vessel transportation and at the same time main-

"YOU NEED TO HAVE VESSEL TRANSPORTATION AND AT THE SAME TIME MAINTAIN FOCUS ON SECURITY."

Marine Transportation*

COMPANY	MARKET CAP (BIL \$) [†]	HEADQUARTERS	QUICK FACTS
AEGEAN MARINE PETROLEUM NETWORK INC. (ANW)	1.27	Piraeus, Greece	Supplies and markets refined marine fuel and lubricants to ships in port and at sea
ARLINGTON TANKERS LTD. (ATB)	0.38	Hamilton, Bermuda	International seaborne transporter of crude oil and petroleum products
DANAOS CORP. (DAC)	1.88	Piraeus, Greece	International owner of containerhips that charters its vessels to liner companies
DIANA SHIPPING INC. (DSX)	1.63	Athens, Greece	Transports iron ore, coal, grain and other dry cargoes
DOUBLE HULL TANKERS INC. (DHT)	0.44	St. Helier, Jersey, Channel Islands	Operates a fleet of double-hull tankers, including very large crude carriers and Aframax tankers
EXCEL MARITIME CARRIERS LTD. (EXM)	1.08	Hamilton, Bermuda	Provides worldwide transportation for many products, including iron, ore, coal and grains
FRONTLINE LTD. (FRO)	3.48	Hamilton, Bermuda	Owens and operates oil tankers, including VLCC, Suezmax and oil/bulk/ore (OBO) carriers
GENCO SHIPPING & TRADING LTD. (GNK)	1.49	New York, N.Y.	Transports iron ore, coal, grain and other dry-bulk cargoes as well as steel products worldwide
GENERAL MARITIME CORP. (GMR)	0.87	New York, N.Y.	Provides international seaborne crude-oil transportation services
HORIZON LINES INC. (HRZ)	0.91	Charlotte, N.C.	Shipping company with 21 vessels providing transportation and sophisticated logistics services
INTERNATIONAL SHIPHOLDING CORP. (ISH)	0.13	Mobile, Ala.	Owens and leases flag vessels providing services to commercial and governmental customers
KIRBY CORP. (KEX)	2.17	Houston, Texas	Operates the nation's largest fleet of inland tank barges and towing vessels
K-SEA TRANSPORTATION PARTNERS LP (KSP)	0.28	East Brunswick, N.J.	Provides refined petroleum products transportation, distribution and logistics services in the U.S.
NAVIOS MARITIME HOLDINGS INC. (NM)	1.35	Piraeus, Greece	Transports dry-bulk commodities, including iron ore, coal and grain
NORDIC AMERICAN TANKER SHIPPING LTD. (NAT)	1.14	Hamilton, Bermuda	Engaged in the seaborne transportation of crude oil
OVERSEAS SHIPHOLDING GROUP INC. (OSG)	2.35	New York, N.Y.	Transports primarily crude oil and petroleum products
SEASPAN CORP. (SSW)	1.90	Hong Kong	Owens and charters a young fleet of 55 containerhips
SHIP FINANCE INTERNATIONAL LTD. (SFL)	1.96	Hamilton, Bermuda	Owens and operates vessels and offshore-related assets
TEEKAY CORP. (TK)	4.34	Nassau, Bahamas	Provides international crude-oil and petroleum product transportation services
TSAKOS ENERGY NAVIGATION LTD. (TNP)	1.35	Athens, Greece	Transports crude oil and petroleum products via international sea waters
U.S. SHIPPING PARTNERS LP (USS)	0.22	Edison, N.J.	Provides long-haul transportation services for refined petroleum products and chemical parcels

*COMPILED FROM THE INDUSTRY CLASSIFICATION BENCHMARK ON SEPT. 18, 2007

[†]AS OF SEPT. 18, 2007

"THE NAME OF THE GAME IS QUICK CUSTOMER DELIVERY, TURN TIME AND UTILIZATION OF YOUR ASSETS."

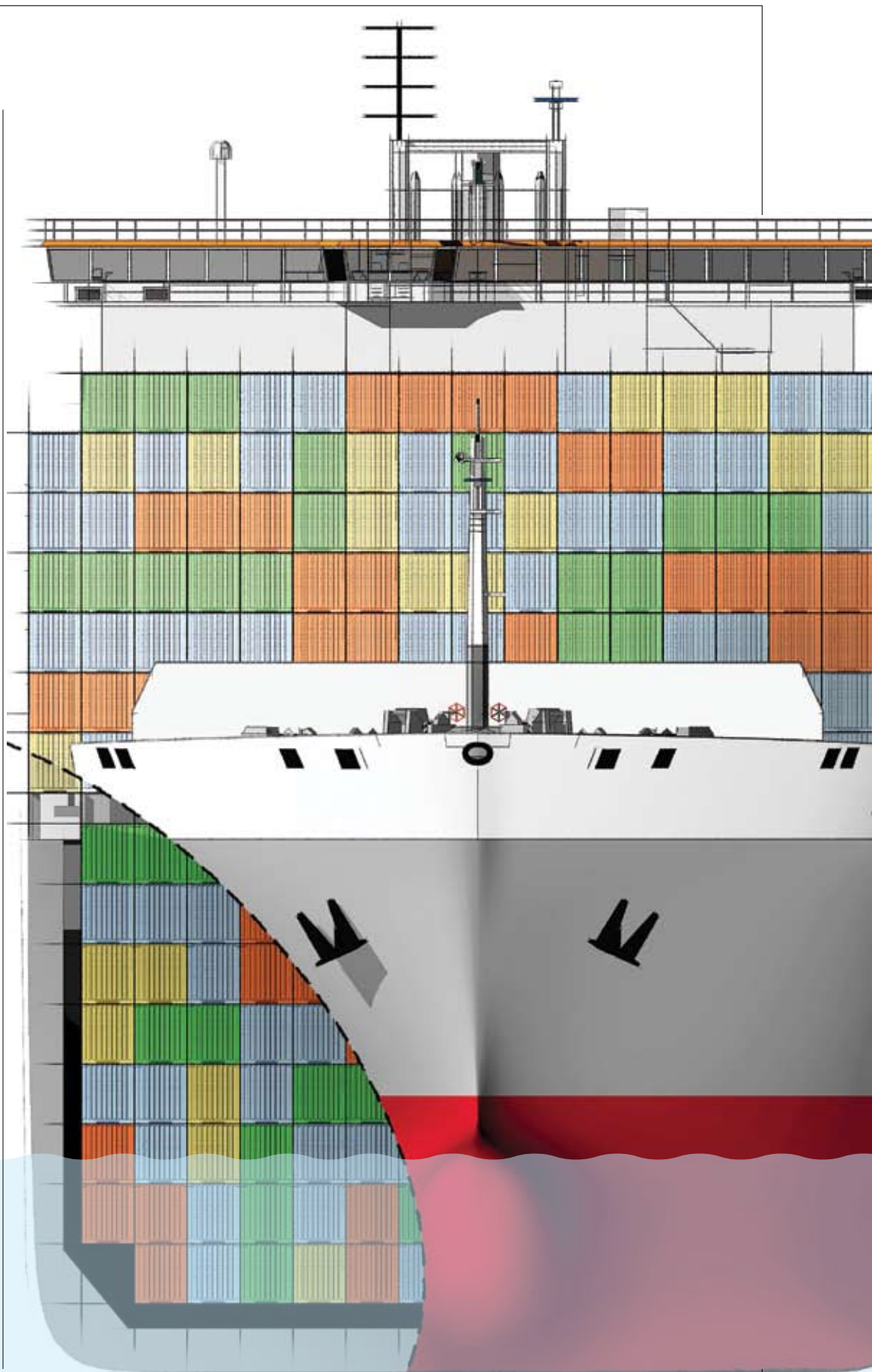
tain focus on security," says Bob Macfarlane, vice president of **CIBER INC.'s** (CBR) Enterprise Security Solutions business unit.

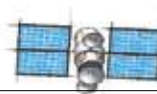
Another priority, companies say, is the environment. They cite several new technologies that are helping the industry become more efficient, reliable, affordable, secure and environmentally friendly. Wang says Seaspan has led the industry in embracing the megacarrier concept, which enables more goods to be transported at lower costs and eats up less fuel. "The bigger vessels also save on labor costs, port expenses and import time," he says, noting that Seaspan pioneered the use of extra large ships in 2000. "Add those things together and you're looking at 25 percent to 30 percent savings."

TRACKING CONTAINERS

Horizon Services Group says it has implemented the first fully functional end-to-end intermodal radio frequency identification technology (RFID) tracking system, which follows containers traveling from the Pacific Northwest to Alaska. Kessler says Horizon installed 30 RFID software readers throughout key locations — at customer distribution centers, along highways and at destination stores. "From the moment a container leaves for a customer load through to delivery at a store," he explains, "we are sending alerts, maximizing everyone's supply-chain efficiency."

Savi Technology, a **LOCKHEED MARTIN CORP.** (LMT) company, uses RFID with satellite systems to pinpoint the location of containers while they are in transit, the company says. It also reports that it uses biometrics, sensors and intrusion-detection devices to supply automated alerts should an unauthorized opening of a container occur. Savi Networks LLC, a joint venture between Savi Technology

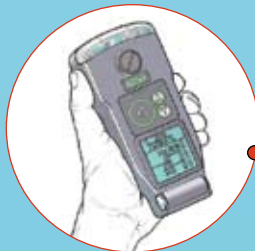




TRACKING CONTAINERS (continued)

and Hutchison Port Holdings, reports Savi, provides an information service called SaviTrak,TM which gives shipping companies real-time online visibility even when containers leave their own supply chain and enter those of suppliers, customers and operators of transportation facilities.

RYDER SYSTEM INC. (R) says it uses a wide range of technologies, including RFID and global positioning system (GPS), among others, to provide comprehensive transportation solutions to its clients, including **CVS CAREMARK CORP.** (CVS). Steve Hitchings, vice president, global supply-chain solutions technology services, says that Ryder's suite of technologies enables its Transportation Management System to track and trace orders as they move from a port to a distribution center or from a distribution center to a store; to make the proper carrier



MINE SAFETY APPLIANCES CO.'S HAND-HELD DETECTORS CAN UNCOVER POTENTIAL THREATS IN CARGO.

"TRACKING CAN REALLY IMPROVE EFFICIENCY AND BETTER USE OF DRIVERS AND VEHICLES."

and mode of transport selection; to integrate data from the customer, supplier and carrier; and to plan the most efficient route possible.

Through the use of GPS, Hitchings says, Ryder's RydeSmart technology provides Internet-enabled real-time tracking of the location of vehicles, which can lead to increased efficiency, lower costs and better driver performance. For example, he points out that RydeSmart monitors a vehicle's speed, the driver's brake use and how often he or she goes off the selected route. "This tracking can really improve efficiency and better use of drivers and vehicles, as well as leverage that equipment to reduce empty miles," he says. "If you can cut the amount of fuel by a gallon a day, it pays for itself."

PORT SECURITY

MINE SAFETY APPLIANCES CO. (MSA) says it has developed hand-held detectors and portable, multipoint wireless systems that first responders can use to detect chemical warfare agents, radiation and other potential terrorist threats at ports.

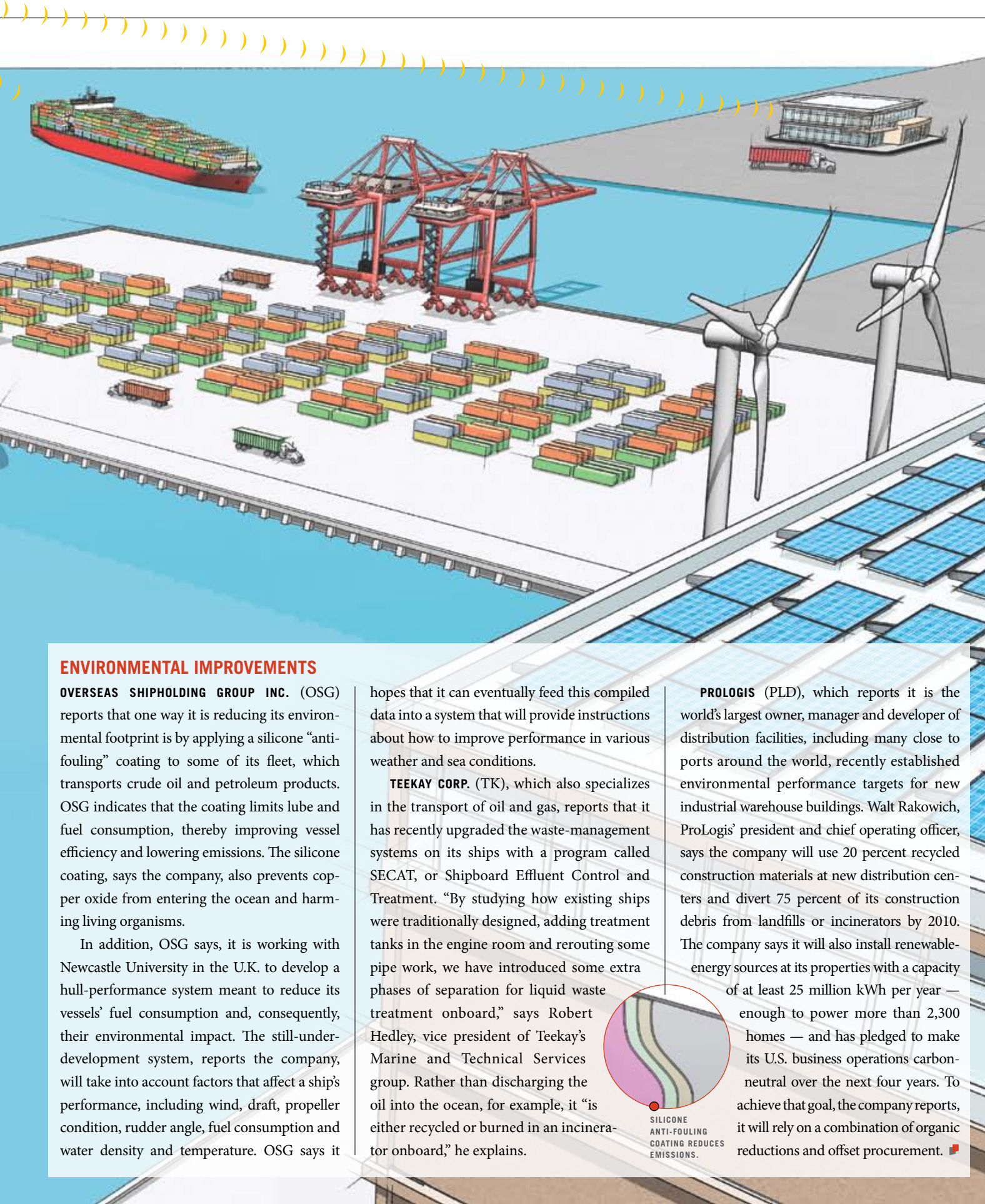
Macfarlane says CIBER's Harbor Management and Security System (HMSTM) integrates a variety of monitoring technologies — including intelligent radar, video tracking and underwater virtual fencing — into one IT solution. CIBER says HMSTM provides access to data, including ship-arrival notifications centralized on a secure, Web-based system. The information can be made available to multiple parties, such as the U.S. Coast Guard and U.S. Customs and Border Protection, so all know

about threats to waterside safety as well as commercial activity. "We can take a video stream of data, a radar stream of data, a notice-of-arrival



CIBER'S UNDERWATER VIRTUAL FENCING HELPS TRACK SHIPS.

stream of data and two or three other things that allow us to raise an alert on an incoming ship that we wouldn't have if we just had video," says Macfarlane.



ENVIRONMENTAL IMPROVEMENTS

OVERSEAS SHIPHOLDING GROUP INC. (OSG) reports that one way it is reducing its environmental footprint is by applying a silicone “anti-fouling” coating to some of its fleet, which transports crude oil and petroleum products. OSG indicates that the coating limits lube and fuel consumption, thereby improving vessel efficiency and lowering emissions. The silicone coating, says the company, also prevents copper oxide from entering the ocean and harming living organisms.

In addition, OSG says, it is working with Newcastle University in the U.K. to develop a hull-performance system meant to reduce its vessels’ fuel consumption and, consequently, their environmental impact. The still-under-development system, reports the company, will take into account factors that affect a ship’s performance, including wind, draft, propeller condition, rudder angle, fuel consumption and water density and temperature. OSG says it

hopes that it can eventually feed this compiled data into a system that will provide instructions about how to improve performance in various weather and sea conditions.

TEEKAY CORP. (TK), which also specializes in the transport of oil and gas, reports that it has recently upgraded the waste-management systems on its ships with a program called SECAT, or Shipboard Effluent Control and Treatment. “By studying how existing ships were traditionally designed, adding treatment tanks in the engine room and rerouting some pipe work, we have introduced some extra phases of separation for liquid waste treatment onboard,” says Robert Hedley, vice president of Teekay’s Marine and Technical Services group. Rather than discharging the oil into the ocean, for example, it “is either recycled or burned in an incinerator onboard,” he explains.

PROLOGIS (PLD), which reports it is the world’s largest owner, manager and developer of distribution facilities, including many close to ports around the world, recently established environmental performance targets for new industrial warehouse buildings. Walt Rakowich, ProLogis’ president and chief operating officer, says the company will use 20 percent recycled construction materials at new distribution centers and divert 75 percent of its construction debris from landfills or incinerators by 2010. The company says it will also install renewable-energy sources at its properties with a capacity of at least 25 million kWh per year — enough to power more than 2,300 homes — and has pledged to make its U.S. business operations carbon-neutral over the next four years. To achieve that goal, the company reports, it will rely on a combination of organic reductions and offset procurement. ■



SILICONE ANTI-FOULING COATING REDUCES EMISSIONS.