

# NORTH TO ALASKA

*Totem Ocean Trailer Express has recently completed a technical adventure that supplements its commitment to Alaska's lifeline with two new ships.*

Alaska depends on imports for survival, bringing in nearly 100 percent of the consumer items needed by its population of 650,000 from the lower 48 US States. Most of those goods arrive on trailer ships sailing out of the port of Tacoma, Washington. One of the two shipping lines splitting that business is Totem Ocean Trailer Express, known by its very appropriate acronym, TOTE.

TOTE began with one ship, the SS *Great Land*, in 1975, joined in 1977 by the S/S *Westward Venture* and in 1993 by the SS *Northern Lights*, running year-round from Tacoma to Anchorage, Alaska. 2003 has seen TOTE bring two new ships on line, *Midnight Sun* and *North Star*. The new ships, known as the Orca class, 840 ft in length and 118 ft wide, are the first commercial ships built at San Diego-based National Steel and Shipbuilding Corporation (NASSCO) since 1990.

The greater part of the cargo carried is comprised of items whose availability the Lower 48 take for granted: food; milk (carried in tank containers for bottling); department store merchandise; building materials; the US mail; and virtually every vehicle traveling Alaska's 12,000 miles of road. This year, for example, TOTE expects to haul 50,000 vehicles to and from Alaska, ranging from new, used and rental automobiles to buses, bulldozers and all-terrain vehicles.

Adding two newbuilds to the fleet has been an adventure for the 28-year-old company. The slow but steady growth of Alaska's population promised increasing business, so from 1994 to 1997 the company participated in a Maritech project with NASSCO, to define requirements for new Alaskan trailer ships. It took a long time to find an opening for the

project in NASSCO's schedule, as the yard's other work kept bumping back its proposed starting dates. In 1998, TOTE got word that the project could get underway. Oddly, it all worked out to TOTE's benefit, as the ships got their opening at just the right moment.

TOTE got its start as a subsidiary of Sun Shipbuilding & Dry Dock, a unit of Philadelphia, Pennsylvania-based Sun Oil Company. In the late 1960s, Sun began building a series of ten ro/ro ships on speculation, looking for viable markets for the vessels as they were rising on the ways. Named the Ponce class, for the lead vessel, *Ponce de Leon*, they constituted one of the last significant US-built ship series. Six of the ships would capitalize on opportunities in trades to Puerto Rico and the Middle East. Four found their way to the US West Coast.

Sun Shipbuilding approached Sea Land, offering two vessels to supplement the carrier's routes between Puget Sound and Alaska.



*North Star*

When Sea Land refused the offer, Sun decided to diversify into the Alaskan trades, opening Totem Ocean Trailer Express as a competitor with Hull No. 673, *Great Land*. Today, TOTE splits the growing Tacoma-Alaska trade with Sea Land's descendant, Horizon Lines. Back in 1975, however, it was a risky move – Alaska's population was then only about 250,000 and the Trans-Alaska pipeline project was only half complete.

Meanwhile, the Shah of Iran had embarked on an ill-fated modernization program for his country, which in its heyday called for several major charters to bring products into the port of Bandar Shahpur. In 1973, Sun sent the first two ships off in that service, Hull 666, today in service as the *El Morro*, and Hull 674, named *Atlantic Spirit*.

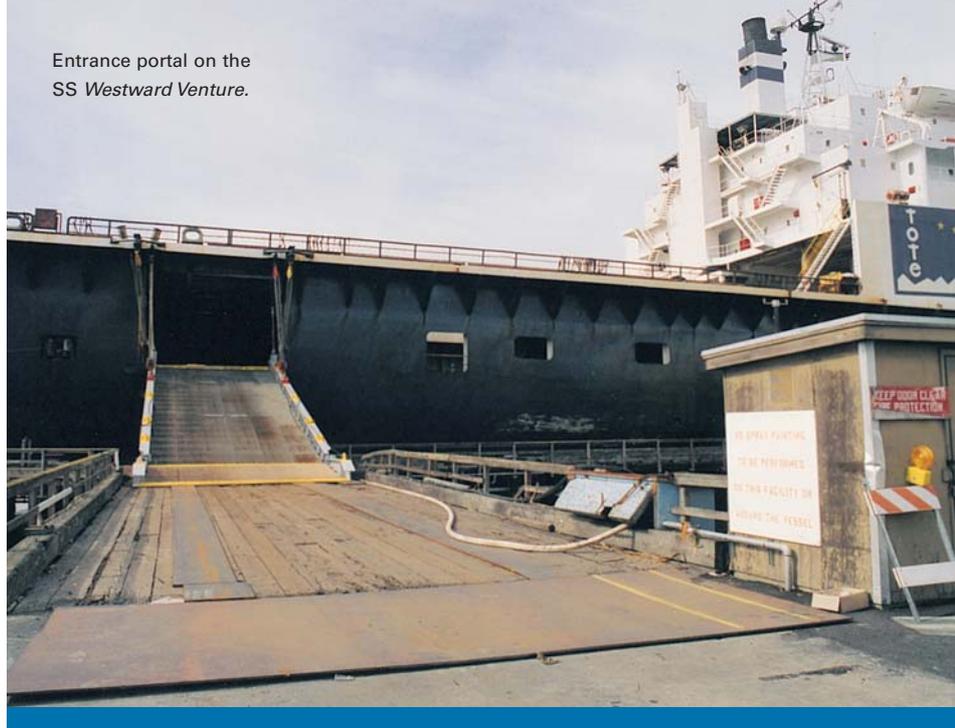
Richard Griffith, today TOTE's Vice President, Marine Operations, was working for Sun at the time. Beginning in Sun's machine shop and drafting departments, he was at the time the designer responsible for construction, repair and conversion, with two patents to his credit for ship equipment designs.

"*Atlantic Spirit* was intended to be TOTE's second ship, while Hull 675 was supposed to go into long-term service to Iran," he recalls. "She had been christened *Saudi Bear*, but we found that was deemed insulting by some Arab nations, so she was renamed the *Gulf Bear*. It was a moot issue anyway, because, in the meantime, the market just dried up completely," he says.

In Iran for Sun at the time, he observed the unraveling of the Shah's plans. "They had more cargo than they could ever get off their docks," he says. "They just kept bringing cargo in to Bandar Shahpur, and it had nowhere to go. After a while they began using cargo as landfill, so they could bring in more cargo. It was really something to see," he recalls, with no small amount of wonder at a dream project turned into waste.

With the charters collapsed, *Atlantic Spirit* returned for a long-term charter to Puerto Rico. *Gulf Bear* was destined for TOTE, and renamed the *Westward Venture*. With three names visible on the hull, the new ship set sail for Tacoma.

Hull 675 was also Griffith's own westward venture, as he accompanied the vessel to



Entrance portal on the SS Westward Venture.

Seattle to become TOTE's Vessel Manager in 1977. Within four years, Sun decided on a return to core competency, divesting the diversification acquired during the previous 15 years. One of the first businesses to go was TOTE, which had been a losing proposition for some time.

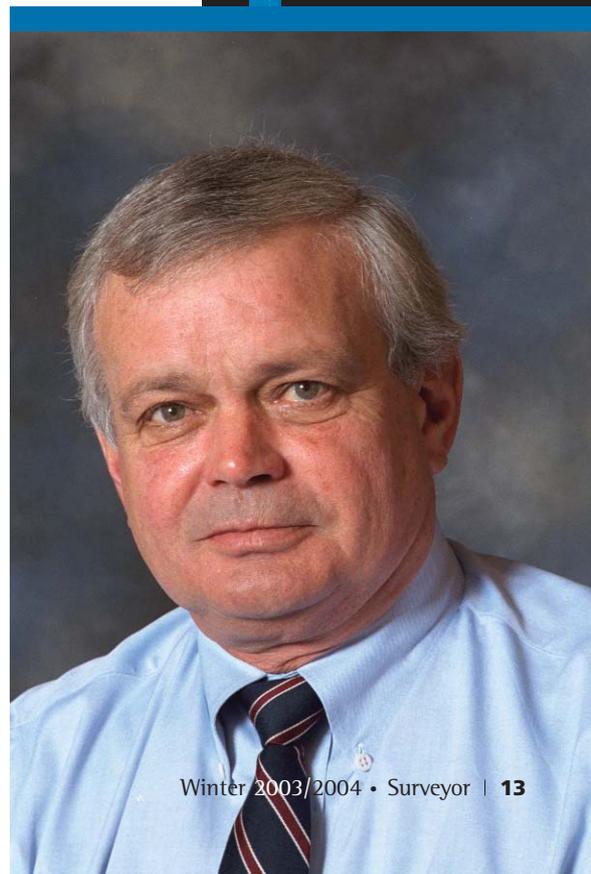
Seeing potential in Alaska, Griffith and seven associates formed Totem Resources and bought the business in 1982. It was a good bet, for within a few years Alaska boomed, TOTE turned around, and the ships ran full yearly for five years solid. In 1984, the company moved to a new facility, its present site on Tacoma's Blair Waterway.

Griffith semi-retired two years later, continuing in the maritime business as an independent consultant. Totem Resources eventually became SaltChuk Resources, a massive group whose maritime activities include TOTE, Foss Maritime, Interocean Uglund Management, Sea Star Lines and other marine companies.

When it came time to add another vessel to TOTE's fleet, TOTE called Griffith back, to supervise the \$50 million expansion and service life extension of a trailer ship purchased out of the now glutted Puerto Rico market. Lengthening the vessel and adding a spar deck, the *Northern Lights*, Sun Hull 670, came into service in



Richard Griffith,  
TOTE Vice President,  
Marine Operations





Midnight Sun

1993. If you look hard, you can still see the name *Puerto Rico* on her hull.

The original idea for the newbuilding project was to build panamax ro/ros, perhaps to capitalize on overseas charters, like the mid-1990s hiring of *Westward Venture* to bring farm equipment from US ports to ports on Russia's Black Sea. Griffith was placed in charge of designing the envelope of the new vessels. His challenge was to arrange the vessel's decks, width and height to maximize capacity, building a ship for the future while adhering to a unique limitation from the past.

TOTE's existing ships have three side entrance ramps, and the existing port facilities were designed for these vessels. So, no matter what TOTE hoped to achieve, the new ships had to have these three openings in the same spot as the older ones.

It took a long time to get the envelope just right because, as they were designing the

vessels, US highway authorities were rapidly increasing allowable highway trailer sizes. At one time, bridge limitations made 12.5 feet the maximum trailer height one could bring into New York State. So the Ponce class ships had been designed for such trailers, with 15 ft deck heights for easy maneuvering. This placed their three side ramp openings at a particular location, which the terminals had been built to accommodate.

The then-maximum trailer dimensions were 8 ft wide and 40 ft long, and seemed to be long-range standards. But beginning in the early 1990s, US highway authorities, pressured by transportation lobbies, notched up trailer sizes three times. Today, the biggest trailers are 53 ft long, 14 ft high, and 8.5 ft wide. Had TOTE been able to build its ships any sooner, the arrival of these new 53-14s would mean the new vessels would already be behind the times.

"With the trailers becoming longer, higher, and wider, we decided to design the ships only for Tacoma-Anchorage service," says Griffith. "It took a very long time to shape the ship, so that it could accommodate all these different standard trailers, to have a few segregated car decks, and to be able to accommodate other cargoes. The concept ship started out at 105 ft wide in 1994. Within a few years we had to drop the panamax idea altogether; we inched up the width over many months, finally getting everything to fit at 118 ft. wide."

With US highway lane widths reduced in many places from 11 ft to 10 ft for increased capacity, Griffith breathes a sigh of relief that the maximum trailer width may finally have been reached.

This led to the next problem: deck height. "It would have been easy if we had had the money to build new facilities at both ends," says Griffith. "But as things stood, we had to work around the fixed locations of the ramps. This limited the possible deck heights; if you add just a few inches to each deck height, by the time you get to Deck Five, your entrance is too high for the existing ramp angles."

The highest they could go, while maintaining the location of the main deck and thus ramp access, was a deck height of 16 ft. To accommodate the highest trailers, they arrived at a unique solution: raise the height of the spar deck to 19 ft. Now, all the 53-14 trailers are

driven onto the spar deck, the vessel's 850-ft length being sufficient to absorb any increase in the employment of these newest behemoths. The three-foot height difference on the spar deck causes a slight hump in the vessel's profile. To the designers, it called to mind the dorsal hump of the killer whale, or orca, and so the Orca class was born.

With the delivery of the Orca class *Midnight Sun* and *North Star*, TOTE's founding carrier vessel the *Great Land* went into a charter with Matson Navigation, serving Hawaii.

The Orca class vessels are the 99th and 100th ships built by TOTE's Vice President of New Ship Design and Construction, industry veteran John Boylston, under whose purview the ship's formidable power plants were developed.

Built to ABS ice class, the ships were designed for a 40-year service life on an extremely demanding route. Winter storms frequently require ships to slow down, awaiting their passing before proceeding. To make up for such slowdowns – or to outrun the storms when feasible – TOTE wanted the ships capable of 24 knots at 85 percent power, a massive requirement for large vessels so heavily laden. Boylston's solution was a set of six engine-generators powering two electric motors driving twin-skegged 20 ft propellers.

More than just propulsive force had to be built into the power train. The system also had to combat a hidden demon in Alaska's Cook Inlet that can be called a kind of maritime Dust Bowl. "The water in Cook Inlet contains a very special silt, a fine-powdered granite dust from glacial outwash that is always present," says Griffith. "It freezes in the ice and becomes a powerful abra-



sive; it takes the paint off our hulls, polishes our props, and removes coatings from our rudders. It penetrates seals and causes cruise ships problems with their electric pod propulsion and controllable-pitch propellers. That's why we have triple oil seals on our tailshafts and use fixed-pitch propellers."

But like Woodie Guthrie sang about Oklahoma of the 1930s, the dust is everywhere, brought aboard ship in ice caked onto trailers, released by the warming sun as the ship heads south. It is a constant battle fought with high-grade filters on all machinery and engine room and deckhouse intakes. But the dust keeps coming. Summer means 'round the clock maintenance.

But fighting nature is part of the job of being one of Alaska's lifelines. Capping off the Orca class' successful design adventure was an unexpected *extra*: the electric propulsion system and double-walled fuel tanks were cited as salient features in prestigious environmental awards from Canada, Alaska and the US Coast Guard, which handed TOTE the Bronze Medal in its 2002 William Benkert Environmental Excellence awards.

February 2003 saw TOTE supporting the war against terror, when the Military Sealift Command chartered *Northern Lights* to carry materiel for the US war effort in Iraq.

