

Reinvention

A revolutionary new float-on/float-off transport system, aimed principally at the shortsea shipping markets, has been unveiled by Emden-based Navtec Consult. Naval architect and chief consultant Hermann Janssen, the proprietor of the company, explained the Trans Sea Lifter concept to **John Fossey**.

Hermann Janssen, owner of Navtec Consult, which has pioneered the Trans Sea Lifter (TSL) system, asserted: 'The TSL actually challenges conventional shipping processes, and it could revolutionise the way cargo is shipped in shortsea and regional markets.'

In fact, the consultant believes that, just as the container transformed general cargo break-bulk shipping/handling practices 50 years ago, TSL can change the scale of shortsea shipping by utilising barges as 'floating super containers'. He explained: 'It could lead to significantly higher levels of investment in barges, rather than feeder vessels.'

While the term 'shortsea shipping' suggests a focus on vessels, it is the implied process of intermodal exchanges and seamless integration of cargo movements within the supply chain that is at the core of the TSL system.

Aspects such as schedule reliability, service speed and frequency of sailings are all critical to the success of the supply chain, and the TSL can help in this respect, as it has a fixed loading and discharge time of 90 minutes, irrespective of cargo volume.

So what is TSL, and how does the system work?

Essentially, it is based on the use of 18,000dwt oceangoing SWATH-type catamarans that shuttle between anchor points – so-called roadsteads – located off the main ports and river systems (eg the Rhine and Elbe in Europe, the Yangtze River in China), picking up and delivering smaller barges loaded with cargo.

At the anchorage, the catamaran's various cargo platforms – there are three in all – are submerged for the loading/discharge operation to take place. The operation is com-



The Segway reinvents walking

pletely flexible, in that all or any combination of the platforms can be submerged simultaneously, depending on planned cargo exchanges.

According to Janssen, it takes 15 minutes for the platforms to be submerged, at which time, two shipborne tugs carried in the rear of the vessel's superstructure commence work by pushing the barges away from the cargo platforms.

If barges are to be loaded, the power units are attached to these, and the reverse takes place. The cargo platforms are then raised, which takes about 25 minutes, the tugs secured back into their position, and the TSL catamaran is ready to sail to the next roadstead.

TSL needs at least 20m of water for the cargo discharge/loading operation to take place, which could present difficulties in certain shallow port/estuarine areas of the world. Having said this, TSL only needs a small area, equivalent to 1.5 times its length (185m), for cargo-handling operations to take place, and its voyage draught of 12m is no different from many other deepsea ships.

Janssen does not view the depth issue as a problem, and says that he has been assured by various charting/mapping groups that this draught is available in most areas where TSL might operate successfully.

He told *CI*: 'Such depths are not shown on most hydrographical charts because they are not needed by existing ships in service. But it

seems that 20m basins/channels of water are available fairly close to the coastline. Otherwise, TSL can anchor further offshore.'

Doubts have been expressed about the ability of barges to be exchanged in inclement weather conditions – most notably, high-speed winds.

Janssen countered: 'Not a problem for TSL. The barges can be loaded/unloaded in conditions up to six on the Beaufort Scale – at which time, ship-to-shore gantry crane operations in ports will have already been suspended.'

The SWATH technology, combined with a dynamic positioning system, provides an extremely stable vessel. Therefore, TSL has few operating restrictions.

And with the SWATH barge's relatively fast service speed of 20 knots, which is significantly faster than many feederships, and its high-speed float-on/float-off (flo/flo) discharge/load cycle time of just 90 minutes – irrespective of cargo volumes being handled – Janssen alluded to considerable operating advantages compared with the conventional system of using hub ports and feederships.

He explained: 'Our flo/flo system enables operators to be highly productive in regional/intra-regional markets. Typical shortsea feeders must deal with short voyages and long lay times. In many cases, vessel lay time can exceed a ship's sailing time. In contrast, by keeping cargo handling time to 90 minutes, the high-value asset – in this case, the TSL vessel – spends its time at sea earning money, instead of sitting idle in the port.'

There is little doubt that ports and terminals are becoming an increasingly significant part of the supply chain. Capacity constraints within ports/terminals have become one of the main reasons why ocean carriers have ploughed more of their investment capital into owning/controlling their own facilities, as reserving/guaranteeing space for future expansion is considered critical.

Indeed, it is delays at ports that are increasingly being blamed for inefficiencies in the supply chain and for raising ocean carriers' costs, as vessels are not being turned around as quickly as they should be.

Janssen explained: 'TSL does not enter port, so the port interface is taken off the critical path of the high-value asset. Barges only need simple and low-cost handling facilities, making the port interface less complex and more universal.'

'In addition, because barges' lay time costs are extremely low compared with, say, a feeder-ship, they can be worked at the most economical time with respect to stevedoring/labour charges etc. Barges can also be used as buffers for storing containers, thereby taking some pressure of



Hermann Janssen,
Navtec Consult

the stacking yards, as the need to turn such low-value assets around is not so great.'

He further explained how TSL, if used in a container feedership role, could help free up space in ports' stacking areas: 'Inbound containers from a mainline containership would be sorted directly into several barges (where possible, according to destination).

'Likewise, outbound containers can be loaded directly from barge to mainline vessel. In effect, the container should never touch dry land during transshipment.

'The beauty with the barges is that they can also travel far inland via the rivers. Hence, TSL enables operators to avoid using expensive and congested main port facilities and crowded roads and rail terminals. This means lower costs, and it should mean faster cargo delivery times for the customer.'

In this respect, the consultant is convinced that TSL can actually help carriers achieve their goals of providing their customers with just-in-time (JIT) and guaranteed delivery time schedules. Both concepts have come under intense pressure over the past two or three years, as operators have had to build more 'buffer time' into their schedules to allow for congested infrastructure.

Janssen argued: 'I am convinced that TSL can bring about the paradigm shift needed to reduce port congestion in the future, while concurrently adding feeder capacity, which is tight in many trades.'

He suggested that the TSL catamaran would, in a European shortsea context, be capable of completing an additional four to five round-trip voyages a year, compared with a conventional container feedership.

He also believes that TSL could be instrumental in fostering closer relationships between the shortsea shipping and inland river shipping

sectors, which he says are currently considered separate entities in many parts of the world: 'There must be ways of developing seamless operations that benefit the service providers, the importers and exporters, and, at the same time, offer competitive alternatives to road and rail.'

The TSL catamaran is extremely flexible, its 76.5m x 32.6m submersible cargo platforms each able to carry barges loaded with up to 6,000 tonnes of cargo. It is also a totally open system, as the platforms have been specially designed to accommodate a large variety of standard barges.

In this respect, the system is very different to previous barge-carrying operations, such as the lash and seabee systems developed in the 1970s/80s – where proprietary barge equipment was needed, and, therefore, usually under the ownership of the main vessel operator. Effectively, these were closed systems.

The executive's daughter, Charlotta Janssen, explained: 'All flat-bottomed craft – whoever owns/operates them – can be accommodated in the TSL system.'

She added: 'And because all types of barges can be carried on TSL, it means customers are offered the widest possible loading opportunities. TSL can lift dry bulk, liquid bulk (tank), containers and ro-ro cargo, such as cars, and this also means that the system is fully adaptable, and can respond remarkably easily to the varying demands of individual routes, ports, seasons and unexpected cargo peaks and troughs.'

Although the TSL system can service many trades, the Janssens see the container market as being 'highly suited' to TSL. Relaying of cargo to smaller ports in Europe is gathering pace, plus the European Commission (EC) is keen to promote marine highways/inland rivers as the most environmentally friendly way of moving cargo.

Should TSL be used purely to move containers, its total slot capacity is 1,848TEU (see 'The TSL vessel').

One of the biggest drawbacks of TSL must be the relatively high price of the SWATH technology and, therefore, the construction costs of the Suezmax oceangoing catamaran. This is estimated at USD100 million – about the same as building a 8,000TEU post-panamax containership.

However, as Hermann Janssen argued: 'Operators should consider such an investment as a one-off expenditure, which should be weighed against the considerable savings that can then be made in operating costs from recurring expenses associated with port/terminal delays.'

He sees the European and US markets as the most likely to embrace the concept, after receiving 'highly positive' feedback.

In Europe, the TSL system could be used predominantly for distributing containers and unaccompanied trailers in all littoral seas from the Baltic to the Mediterranean and Black Sea. There would also be interesting new possibilities in transporting barges between Western Europe's waterways, Scandinavia/Finland (cars, forest products and papers) and the extensive waterway system of Russia.

In the US, the Janssens see potential in using TSL to relay trailer traffic to/from areas such as Massachusetts and Florida, between Los Angeles and San Francisco, California and Oregon/Washington.

Hermann Janssen explained: 'Rising concerns over the environment and safety issues, plus driver shortages and highway congestion, mean that over-the-road trucking is out of favour politically, and is becoming more unacceptable, while delivery times are getting longer year-on-year. TSL could help by taking the longhaul component out of the equation.'

As to opportunities in Asia, the consultant admitted to not having studied or pushed its application in this region: 'However, I do believe TSL, in principle, has global appeal.'

Asked about the possibility of a TSL catamaran being used in the deepsea liner shipping trades – such as moving barges loaded with containers from the Yangtze to the Rhine in Europe or to the Columbia/Snake river system in the US – he felt the economies of scale did not work compared with 5,000TEU post-panamax ships and above.

He admitted that his toughest challenge was finding a strong partner that understands the way the TSL will improve its operations.

Hermann Janssen asserted: 'The shipping industry is conservative, and hesitates to adopt innovation until it sees firm results of it working in practice. However, recent bottlenecks in the liner shipping industry have raised awareness for better co-ordination between the global shipping lanes and regional distribution activities. It appears that taking advantage of the first-to-market opportunities will reap more benefits now than ever before.'

THE TSL VESSEL

The Trans Sea Lifter (TSL) catamaran uses proven SWATH and submarine design technology, which makes it highly stable in all sea conditions.

It has three cargo platforms, 76.5m wide and 32.6m long, each of which has a gross loading capacity of 6,600 tonnes. The platforms are 8m above sea when the barge is sailing, and are submerged to 4.3m below sea level when loading/discharge operations are in place.

Cargo-handling operations are highly flexible, in that the cargo platforms can all be submerged at the same time or individually, depending on the requirements of each voyage.

The principal design features of the TSL barge comprise:

- ▶ Length overall: 185m
- ▶ Breadth: 76.5m (suezmax)
- ▶ Voyage draught: 12m



The TSL catamaran

- ▶ Barge discharge/loading draught: 20m
- ▶ GRT: 19,800 tonnes
- ▶ DWT: 16,116 tonnes
- ▶ Container capacity: 1,848TEU
- ▶ Container capacity at 14 tonnes homogenous: 1,151TEU
- ▶ Engines: 4 x Wartsila 46F
- ▶ Maximum speed: 21.7 knots
- ▶ Sailing speed: 20 knots
- ▶ Crew: 14 persons