



TUGS TOWING & OFFSHORE NEWS SPECIAL

Twenty five years ago

No bridge too far for Smit Transport & Heavy Lift.

For two years, the submersible heavy transport pontoons from Smit Transport & Heavy Lift, “**Giant 3**” and “**Giant 4**”, have been involved in the transport of parts for the bridge-tunnel connection across the Öresund between Malmö, Sweden and Copenhagen, Denmark.



Over a period of 22 months, 25 transport trips took place between Cadiz, in southern Spain, and aforementioned Malmö. Two bridge sections were placed on each pontoon, varying in length from 120 meters. and 140 meters. However, during the last transport, only one section of 140 meters was transported. A total of 49 bridge parts, 42 of 140 meters and 7 of 120 meters.

As early as 1995, Smit Transport was approached by Dragados Offshore, the Spanish subcontractor of Sundlink contractors, and builder of the bridge sections, to ask whether Smit Transport wanted to submit a quote for the transport of these bridge sections. A busy time began for the Smit Transport and Engineering departments. These departments started with respectively the preparations for the transport and the designs to slide the bridge parts from the embankment onto the pontoon; sea fastenings etc. everything in such a way that it could be used for all transports. Drawings were made to adapt the pontoons for the transport of these long sections. Finally, the client could be offered a thorough plan to carry out this transport. The quotation was also submitted. Smit Transport was able to offer its two identical Giant pontoons, the "**Giant 3**" and the "**Giant 4**" for this assignment, with the "**Giant 2**" as backup. This was an important fact for Dragados. After all, one drawing and one plan were sufficient for transport across the construction site and loading. Smit Transport was ultimately able to win the order.



A gigantic project would start in 1997.

Construction for the transport of the first sections of bridge parts started in mid-1997. We hereby mention: The so-called skid tracks, necessary to get the bridge parts from the embankment onto the pontoon. The sea fasteners, necessary for sea transport, including the pitch stoppers, to keep the bridge parts in place during the pitching movement and the roller stoppers, to keep the bridge parts in place during swinging movements.

The pontoons also got a different appearance. For example, the cargo deck was extended by 10 meters by removing the above-deck ballast tanks and cargo hold sections. The hull at the rear of BB and SB was reinforced over a length of 30 meters.



(Welding reinforcement plates aft ships)

After the construction of the skid tracks was completed, they were placed on the Giant's, together with the sea fastenings. Creating one skid track as far as possible to the bow and the other at the rear, with a length of 100 meters between the

centre lines of these tracks.

In the meantime, Dragados Offshore had not been sitting idle. They had started setting up a production line for the construction of the bridge parts. A hall was designed and built where the cement deck could be poured. Molds were built for pouring the cement. Also the so-called load-off quay with a special sea bed, for landing the pontoons, was prepared. Of course, this was a job that could not be accomplished overnight.

Malmö also did not sit still. Even though they have to deal with the entire bridge and tunnel construction, we limit ourselves here to the reception of the pontoons. Facilities were made to moor the Giants there and unload the bridge sections. Unlike Cadiz, Malmö has almost no tidal range. The need to land the Giants here for unloading was therefore not an issue. Nevertheless, a special mooring quay was designed. The quay consisted of two piers, which connected lengthwise to the skid tracks located at right angles to the pontoon.

Also in the preparation period was the conclusion of contracts with SmitWijs for the supply of sea tugs. Because SmitWijs was quite busy itself, it was necessary to look into hiring tugboats from other shipping companies. International Transport Contractors (I.T.C.) from Heemstede was approached and they were able to supply two



Photo: Marcel & Ruud Coster

identical sea tugs during the entire transport period. They became the "**Sumatras**" and the "**Suhaili**". Both tugs with a bollard pull of 100 tons and 8200 BHP.

Finally, in the summer of 1997, the time had come and the first "Oresund" bridge section, 120 meters long, was built in Cadiz, on the coast of Andalusia and the oldest city in Europe. ready for transport to Sweden at Dragados Offshore. The second part, also 120 meters long, soon followed, the production line was running at full speed. However, it took until mid-September before the first bridge section could be loaded.



Photo: Towingline After the first two bridge sections, with a length of 120 meters, a width of 25 meters and a height of 11 meters and constructed of steel and concrete, were loaded onto the "**Giant 3**" the first transport of 25 trips left Cadiz on November 1, 1997. to the North Harbor in Malmö. These two parts, E28 and

E27, were the first parts of the eastern bridge on the Swedish side. The length of this section is 3739 m, while the western bridge, on the Danish side, is 3014 m. The weight of this steel/concrete construction is approximately 4700 tons for the 120 m sections and 5200 tons for the 140 m lengths. The total weight that the Giant pontoons had to carry was almost 10,000 tons. The weight of the ballast water is taken into account, this is the so-called "to prevent cat's back", it can be said that the transport weight was almost 20,000 tons. The draft of the pontoons was therefore on average 5.70 meters. This is quite a tough towing job for the tugs.

Heavy north-westerly storms hit the transport

That it was quite a tough towing job became apparent soon after departure on November 1, 1997, the "**Sumatras**", which was the first tug boat to take the lead with the "**Giant 3**" on the mooring line. However when approaching the Gulf of Biscay they faces the first winter storms, which are always present in these areas around that time of the year. Fortunately, everything remained intact and the transport could be safely delivered to Malmo 19 days after departure from Cadiz. Upon arrival, Captain Kees Koops was asked whether he had been afraid during the transport of these bridge sections. His answer was from a real tugboat captain. "I wasn't afraid, but I was worried."

Although construction by Dragados was already 3 months behind schedule at the start of the second transport with the "**Suhaili**" as towing tug. The second voyage could start without any problems. This journey went well, there were some bad weather periods, but

she walked neatly between the depressions and after 14 days she arrived at the Malmö roadstead. A schedule that was somewhat anticipated at the start of this contract.

Photo: Joop Marechal

The known problems, which we call teething problems here, had not yet been completely resolved in the southern tip of Europe. After delivering her bridge pieces in Malmö, the "**Suhaili**" could not immediately return to Cadiz, she was requested to... to stay in Malmö. The



"**Sumatras**" with the "**Giant 3**" was not yet loaded and therefore not ready to leave Cadiz, which meant that the "**Suhaili**" with the "**Giant 4**" could not yet reach Cadiz.

Slowly but surely, as the project progressed, a system began to form and continuity in transport emerged. Loading in Cadiz went more smoothly and unloading in Malmö also went as planned. Very carefully, some days of the backlog could be cleared. But one could not yet speak of a jubilant mood, as it was still a winter day. On trip no. 4 this became all too clear. When returning south with the empty pontoon, Captain Koops, now on board the "**Suhaili**", had to look for shelter on April 2, 1998. Because the skid tracks on the pontoons are about 6 mtrs. beyond the sides of the pontoons, one could not simply enter a harbour. The shelter was found in the Seine Bay. The "**Suhaili**" managed to keep the "**Giant 4**" going for two days before the weather improved a bit and she could continue her journey.

The winter weather was still not over when they wanted to start trip number 5. The weather reports for the Portuguese coast were such that Captain Willem van Beek of the "**Sumatras**" had to postpone his departure from Cadiz. Here too, they had to wait two days until the depression of the North Atlantic had managed to find its way in such a way that departure from Cadiz was justified. While Koops was seeking shelter on April 2, van Beek left Cadiz. Things went well for three days, but... Lisbon, Van Beek decided to shift his course to a more southern one. The depression that had run away from him had developed to such an extent that there was no way through it. The direction had also changed, so he would have to box against it. After maintaining a southerly course for two days, it was possible to slowly return to the north. Here too, everything remained intact and 20 days after departure from Cadiz, this transport could also be safely delivered to Malmö.

Trip number: 5 still had to deal with some of the winter weather, but it could be concluded that summer time had arrived. The following trips went very quickly, so fast that trip no. 8 with the "**Suhaili**" and under the command of captain Gijs Dijkdrenth broke the record. On June 11, 1998, he left Cadiz to deliver the "**Giant 4**" in the North Harbor in Malmö 11 days

later, on June 22, 1998. The return journeys also went quite smoothly and without problems, the Malmö - Cadiz journey could be completed in 10 days.

If there was a backlog of 2.5 months in the transport planning that Dragados had made at the start of the contract. At the start of the summer season, this had now been reduced to 1.5 months. So it went well and without any problems. However, during voyage number 10, upon arrival in Malmö, they encountered technical problems with the "[Suhaili](#)". These problems were of such a nature that the tug had to be replaced. I.T.C. was able to bring in the sister ship "[Simoon](#)" and with this tug of the same type and power the bridge transport was continued without any delays.



Photo: Ria Maat

The winter season started again and during, like the devil is playing with it, trip number: 13 it was pretty bad again. While sailing in the Sont, the "[Simoon](#)", with captain Jan Nieuwhof, was confronted with quite a bit of bad weather. It was so bad that he was forced to fill two empty aft bunkers with

ballast water to put more weight in the tug. The "[Giant 3](#)" also suffered some minor damage. The spare tow wire, which was lashed to the railing on the bow, came loose. The railing was partially torn off the deck. Nieuwhof also managed to bring in his tow safely despite these weather conditions.

On January 17, 1999, Captain Jan van Driel, voyage no. 17, departed from Cadiz on the "[Simoon](#)". A journey that Van Driel will remember for a long time. There was no problem in the air when he left, but there was a depression in the north. The North Sea once again did not show its best side. But Van Driel did not see any problem, after all it would take another 10 days before he would enter this area and then the weather conditions could have improved. However, it turned out to be no better, although he could continue to develop a steady speed of 4 miles, on February 5, 1999, a very deep depression came over his transport. The speed decreased to such an extent that he came to a standstill and even worse, the tow ran away with his tugboat. It was also a horror around him, colleagues lost their tows and were in trouble. Van Driel decided to further extend his towing line at night. This caused the towing wire to come to the ground and once again increased the risk of breaking. What Van Driel did achieve was that the transport no longer moved backwards and came to a standstill. Captain Van Driel's plan succeeded wonderfully, especially now that people had adjourned above the Wadden Islands and were in danger of grounding on the banks. Due to the difficult and impassable sea, nothing further could be done. After ship deliberation it was agreed to wait for daylight as long as it was possible. At dawn it was

noticed that the wind decreased slightly in strength. During the night the transport had been moved back quite a bit, but most importantly, the connection had remained intact. As the day progressed the weather slowly but surely improved and the towing line could be taken up a little again. In the course of the afternoon, even small progress was made again. Space was explored again and the speed gradually increased. It may be called a miracle that the tow had not become loose from its towing wire. Good seamanship and solid equipment made the difference that after 15 days of struggle, a transport could be delivered safely again.



Arrival in Malmö

Whether it was due to the weather conditions or not, the "**Simoon**" had to be taken out of service at the start of voyage no. 21 due to machine problems. Initially, I.T.C. not include a sister ship in the transport as they were too far away from the location and stagnation would therefore occur. She was therefore replaced by the "**Anglian Duke**" of Klyne Tugs from Lowestoft. This was able to leave Cadiz without delay on transport 21 on April 19, 1999.



Photo: Pieter Inpijn

However, the "**Anglian Duke**" made just over $\frac{3}{4}$ of the journey, because on the return trip to Cadiz the "**Solano**" was able to reach Lisbon takes over. I.T.C. so again had two sister ships in the project. However, the change of ships was not yet completely over, because to make matters worse, the

"**Sumatras**", which had been active in this transport from the start, had to deal with machine problems. The "**Simoon**" had now been repaired and could therefore immediately replace the "**Sumatras**". Both tugs, the "**Simoon**" and the "**Solano**" were able to complete the transport project without any significant problems.

Photo: Leen van der Meijden

The last trip no. 25 would almost have thrown a spanner in the works for a good outcome. On the day of departure from Cadiz, July 7, 1999, it was possible to tie up for departure in the morning. Everything was ready. The "Giant 3", with only one bridge



section on her deck on the port side and therefore heavily ballasted, was waiting for the tugboat to pick her up. But the innkeeper had been ignored. At the moment of departure, the tugboat had already been secured, the Levante, so infamous in Cadiz, arrived. This easterly wind with a force of 7 to 9 Beaufort was at right angles to the tow and tugboat. Captain van Driel, captain of the "Solano" at the time, did not take any risks and, in consultation with the pilot, surveyor, Smit and Dragados, cancelled the departure. Towards the evening it would be reconsidered whether the transport would leave. Once again it turned out that the Levante had not yet finished its run and departure proved impossible. It took until the following evening before the signal for safe departure could be given. By noon the weather changed like a leaf from a tree, in the morning there was still a strong easterly wind, in the afternoon it turned first to the south and then to the west with a lee of 3 Beaufort.

For Dragados it was a relief and one less thing to worry about: the champagne could be served, but for Van Driel and his men it was still a matter of 2 weeks of dragging their feet and keeping their heads down. However, on July 19, 1999, the last bridge section W02 could be safely transferred to the Swedish-Danish consortium.



Cadiz - Dragados offshore construction site

This marked the end of a two-year transport project. A project that was successfully completed without damage and major problems through craftsmanship and a

large dose of dedication.

Finally, the following figures stand out from this project:

- 4 Smit Transport ballast engineers were deployed in this project, namely: *Maarten Versluijs* – project manager; *Hans van der Ster* – project engineer; *Dirk Prins* and *Harry van Zon* – engineers. They had to ballast and deballast the pontoons many times. Thousands of tons of water have entered the tanks and then been pumped out again.
- 2 Smit Transport pontoons, the "**Giant 3**" and the "**Giant 4**", transported the bridge span on the deck. They transported a total of 66,182 tons of steel and 157,304 tons of concrete, which equates to a total weight of 223,486 tons and a total length of 6,720 meters.
- 8 tugboat captains were involved in the transport, namely: *Kees Koops*, *Gijs Dijkdrenth*, *Willem van Beek*, *Heertje Starrenburg*, *Jan Nieuwhof*, *Charlie Jacolino*, *Jan van Driel* and *Martin Davies*.

Photo: Svanen positioned bridge span

- 5 tugboats provided the transport, namely: the "**Sumatras**" the "**Suhaili**" the "**Simoon**" the "**Solano**", from I.T.C. from Heemstede and the "**Anglian Duke**" by Klyne Tugs from Lowestoft. Together they covered a distance of 97,413 miles with the loaded and unloaded pontoons. There may be a distance, if one notes that this is almost 2.5 times around the Earth.



- The tugboats have been at sea for 615 days together and another 150 are waiting before they can go in. Figures that show that this was a project that constantly required the utmost concentration and commitment from everyone. This has been successful and Smit Transport & Heavy Lift can look back on a very successful transport period in its existence. It will probably take some time before such a project can be secured and the above figures can be matched or improved.

A short history of the Oresund Bridge



A globally renowned icon, the bridge is in fact part rail/road bridge and part tunnel spanning the Oresund (or ‘The Sound’) between Denmark and Sweden. It was completed in 2000, just within one year from the last span delivery, but it has a rather long and convoluted history. It is a symbol of many and sometimes opposing things: Nordic cooperation in the economy and engineering, as well as the solving of grisly real or imagined crimes; freedom of movement, with thousands of commuters travelling both ways on a daily basis, as well as more recently policed borders with associated identification checks. Regardless of the different perspectives, it is an undeniable, physical link between continental Europe and the rest of the Nordics, and an image of cross-border relationships.

The opening of the bridge to traffic in 2000 had a huge social and economic impact on both Denmark and Sweden. The ten-minute ride encouraged a great deal of mobility and the flow of manpower, goods and services. The number of daily commuters grew from 3,291 in 2000 to 18,000 in 2010. The link has led to new opportunities: for example, in 2005 many Danes moved to Sweden to escape the sky-rocketing house prices in Denmark and commuted daily to work. A Danish labour shortage in the mid-2000s led to Danish employers recruiting Swedes. Even the economic crisis of 2008 did not significantly reduce the number of commuters. However, the increased number of refugees in 2015 was a staunch reminder that the Oresund bridge remains a physical border between two states. With the flow of refugees preferring Sweden to Denmark in which to apply for asylum, many of the 163,000 applicants heading towards the Oresund bridge passed through Denmark and were initially registered here rather than in Sweden (under the Dublin rules).

In September 2015, the Danes decided to suspend registration outraging the Swedish government and, since December 2015, the Swedish police have been checking traveller identification on trains and buses crossing the Sound. The Danish police again implemented border controls due to security worries in late 2019.

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