

AROSA – A first of its kind, and a well-maintained tanker



The AROSA is an excellent example of the benefits of a sound maintenance programme.

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After the EXXON VALDEZ oil spill and the US reaction to it, such as the introduction of OPA 90 and the request for safer crude oil tankers, various suggestions were put forward as to how a large oil spill from a tanker could be avoided in a grounding or collision. The concept of the double-hull construction eventually triumphed, but was initially met with considerable resistance. One argument was the expected difficulties of maintaining the coating of the huge steel areas of the ballast tanks, the rather narrow spaces formed by the inner and outer hulls. Cracks in large single skin tankers were not uncommon, and in double hull tankers that could mean a leakage of oil from cargo tanks to the ballast tanks and thus a risk of both explosion and pollution. Knowing the tendency of many owners not to keep up the maintenance of ballast tanks of older vessels, there was much concern at the time about how the double hull spaces would be maintained and how proper inspections could be carried out when such vessels came of age.

The first double hull VLCCs started trading in 1993 – and Gard has been waiting for these tankers to reach a certain age to gain experience from their condition. Therefore there was some anticipation last autumn when Gard’s senior technical adviser was

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invited to inspect the very first of the double hull VLCCs: the AROSA, managed by Neda Maritime Agency Co. Ltd, of Piraeus. The Greek-flagged vessel was to come to her home port of Piraeus for the first time. An opportunity not to be missed.

The world’s first double hull VLCC

The AROSA, a 291,000 ton deadweight oil tanker, was delivered by Hitachi Zosen in February 1993 and then started to trade as the first double-hulled VLCC ever. With a

length overall of 328 m, a breadth of 58 m and a scantling draft of 21.6 m the vessel would have qualified for a ULCC designation had she been of single skin construction.

Neda Maritime Agency was not new to tankers, having been entrusted with the management of their first one, a T2 tanker, in 1945 and their first VLCC in 1973. Over the years their principals had ordered many new vessels and had a particularly good rapport with Hitachi Zosen in Japan – in 1952 the Neda Group had been one of the first foreign companies to place an order with the yard. In 1989 the yard was pleased to accept their order for a large single-skin tanker, with an option to change it into a double-hull. In 1990 OPA 90 was introduced, but the IMO was still undecided as to a requirement for double hull construction. With the 1991 deadline for their option approaching, Neda had to reach a decision, but could get no clear signal from the international rule makers. After studying the recommendations of the report “Tanker



Valves in pump room: all clean, numbered and secured in position as indicated by rope attachment, turning bar close to hand.

Spills: Prevention by Design”, issued at the time by the US National Research Council’s especially formed Committee on Tank Vessel Design, Neda ended up going for a double hull – a right decision as it turned out later.

Building the vessel ahead of regulations was a demanding task, but a positive attitude by the plan approval staff at Lloyd’s Register as well as good co-operation with the chief naval architect at Hitachi made things a bit easier.

A visit on board

Gard’s senior technical adviser went on board the AROSA at Piraeus in August 2006. Some months earlier, the 13 year old vessel had been through advanced hull measurements and close up inspection by Lloyd’s Register. No diminution of steel had been found, no fractures, no weaknesses whatsoever, and the vessel had achieved a CAP1 rating.¹

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Arriving at the vessel’s anchorage outside Piraeus, the Gard representative noted the side-shell of the giant tanker showing some signs of a vessel in operation. Marks from large fenders were evident, as the vessel trades in the spot market and often

discharges in ship to ship operations. But the damage to the paint in these areas was the only sign of rust found on the vessel. From the deck, the vessel looked like a new-building, newly painted and ready for delivery. Not one spot of rust was seen, not even on deck fittings, pipes or deck equipment.

On deck all hawsers and wires on drums were noted to be covered by canvas, protected both against sunrays and sea spray. All pipelines were marked for last test and inspection, all valves were seen fitted with Denso wrapping, an expensive but efficient corrosion protection. Safe lanes for movements on deck were marked by white lines, all obstacles painted bright yellow. Anti-slip paint had been applied in all lanes and covered, for instance, the entire deck area in way of the anchor windlasses and mooring equipment forward.

In order to survey a ballast tank, the Gard representative descended all the way from the deck to the centre girder of the double bottom. The observations made were the same as on deck: no unpainted areas, not even a rusty edge. Paint touch-ups were evident though – the tank was obviously the subject of regular maintenance. It was also a surprisingly clean ballast tank, without any accumulation of mud anywhere. The access to all areas of the tank was very easy, the stringers serving as main platforms.

Removable aluminum ladders with rubber-covered ends to avoid scraping the coating were available for inspection of side structures between the stringers. Main ladders between stringers were of strong construction, arranged for easy climbing and there were solid handrails where needed. Even on the ladders the coating was intact, without signs of corrosion.

All other areas of the vessel gave the same impression: cleanliness, efficient maintenance and good order. Tanker pump rooms normally have some oil stains and may be quite messy at the bottom. The AROSA’s pump room was totally clean and there was not even a smell of oil. Painted in white, the pump room gave more an impression of a hospital. The bottom plates were dry and clean, showing no sign of either oil or water. The engine room was the same, clean and without sign of leakages. Throughout the vessel no temporary solutions were seen, no patching up, no missing bolts, no leaking gaskets, no broken gear of any kind. The meaning of the expression “ship-shape” came to mind, as there was good order everywhere.

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In the master’s office the Minimum Safe Manning List,² in which the flag authority stipulates the minimum manning to operate the ship, was examined. The AROSA, a 328-metre long tanker, able to perform a speed of more than 16 knots loaded with some 280,000 tons of oil, is allowed by regulation to sail world-wide with only 12 men to cover the functions of the bridge, the engine room, the cargo control and the galley. The fully-automated engine room and the well-instrumented bridge make this possible. When the crew list was checked there was a new surprise: the AROSA has 35 crew, three

¹ CAP stands for Condition Assessment Program. Most oil majors normally require tankers to hold at least a CAP 2 rating if more than 15 years of age. CAP 1 means the tanker has similar quality to that of a new ship, CAP 3 represents a minimum for being classed, CAP 2 is something between the two, above average.

² Required by Ch.V Reg. 14 (2) of SOLAS Consolidated Edition 2004.

times the requirement of the Minimum Safe Manning List! Both the bridge and the engine room teams are strengthened, and there are important additional staff like an electrician and a pump man, and, remarkably, four fitters permanently dedicated to inspection and maintenance of the paint systems.

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Quality-minded owners and managers

Behind the success of the AROSA there are some clear signs of a commitment to safety by owners, operating managers, technical staff, officers and crew. One notes their pride in having a ship in good order, pride of belonging to a winning team, pride in doing things the right way. Following are some examples of the *modus operandi* of the owners and managers of the AROSA.

“Budget is what it costs” is a saying in Neda Maritime Agency, meaning there is no requirement to stay within the budget at the expense of safety, efficiency and preparedness. Money is not wasted, but is

always available for a good cause. The owners seem to prefer to pay to avoid anticipated risks, rather than paying much more when problems arise due to lack of awareness.

Neda Maritime Agency presently operates 21 vessels (eight tankers and 13 bulk carriers), so it is no longer a small company. But some small company advantages are still present, like knowledge of the entire staff, ease of communication, team motivation and a feeling of pride and responsibility in the entire organisation. There is also “hands-on” control enabling managers to give fast priority to matters of importance.

All vessels in the fleet fly the Greek flag. It may not be the best economical choice, but it is the flag of a traditional seafaring nation, which carries along the history and traditions of the people in charge. The officers of all the vessels are Greek and directly employed by Neda Maritime Agency. At change-over of key personnel, the new person is given ample time to get to know the vessel, normally on one voyage before taking over.

The crew members, mostly from the Philippines, are also recruited on a long term basis. Appreciating the conditions on board, the crew members are dedicated to their tasks and want to come back. You treat people well, and they are loyal to you and are proud of the company they work for.

Many of the crew members have been with Neda Maritime Agency for many years.

There is no shortage of staff on board, no intention to save at the expense of the vessel’s safety and crew well-being. There are sufficient crew members employed to allow proper watch-keeping with a look-out and for maintaining the vessel. Also, there is no hesitation, for instance, in booking a pilot for the English Channel or flying in an extra pump man and a chief officer if that can ease continuous cargo discharge operations in the US, complying with the limits set for working hours.

The ships are visited regularly. Senior Neda management use every opportunity to go on board company vessels to demonstrate the hands-on approach common in a tightly-knit company. Frequent visits to the ships by other members of the shore staff are also a part of the policy, and each superintendent will normally have no more than two to four ships under his responsibility.

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How good maintenance pays back

Owning and operating good ships rather than bad ones is no doubt rewarding. The knowledge that you are providing good jobs to many people must be a satisfaction in itself, especially if those people are happy and working well. Charterers will know the reputation of a quality-minded owner and be eager to charter his vessels. There are fewer disputes, so charter invoices are paid without delay. There will be fewer surprises in the operation of the vessel and consequently less days off-hire. When in dock, the manager of a well-maintained vessel will get no cost-related surprises and his ship will only have short stopovers before being out trading again as expected. The day the owner should decide to sell his vessel, there will be no lack of buyers.

Finally, and this we know for sure, a well-maintained ship has fewer accidents and claims, and a good record will secure for an owner the best rates possible for his insurance needs. ■



Crew members busy transporting tins of paint for maintaining the vessel. Note the marked lane with non-skid coating.

A good start for a good ship

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The AROSA, the world's first double hull VLCC, is very much the brain-child of Gerry Vagliano, a naval architect who has been with Neda Maritime's London agents, Lykiardopulo & Co., all his working life. Still active in that office, he has been asked by Gard News to reveal some of the ideas behind a vessel showing no sign of aging almost 14 years after delivery.

"To start with, you need a well-qualified technical department with a wide range of skills. The building of a good ship starts with putting a lot of work into a detailed specification", Vagliano says. "Then, in the building yard you need a good, experienced team to follow up the work. We may spend as much as 1½ per cent of the new-building costs on supervision. For the AROSA we had a team of six to eight hard-working specialists, and they did a magnificent job. Having built several vessels with Hitachi earlier on, the company was well known to the yard and has enjoyed a very good co-operation with it over many years. Our site-team leader, David Manning, had the ability not only to obtain our contractual requirements, but also to maintain and build a good relationship on a personal level. It is very important, especially in the meeting of two cultures, that there is mutual respect between the parties. Starting off on the right footing with the yard, the job was done in an atmosphere of friendliness and co-operation, which makes life easier for all and everything possible.

"Building the first double-hull VLCC ahead of new regulations meant taking a lot of new considerations into account. We were breaking new ground, but we could draw on our experience from both single-skin tankers and bulk carriers. We also used technology from gas carriers in finding good gas detectors for the ballast spaces. During the planning and construction phases of the

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AROSA, our files ended up with 3,500 letters, exchanged by ourselves, the yard and the class society. The fact that we could demonstrate high technical knowledge helped us in obtaining agreement from both

yard and class for a number of our ideas. The process of establishing approved drawings took as long as one and a half years, which demonstrates the work we put into it. We enjoyed excellent co-operation with both Hitachi and Lloyd's Register. The yard looked at the new type of vessel as a challenge, and building a good ship meant a lot to their reputation. They therefore allowed us to incorporate many good ideas, possibly at the cost of their earnings. For instance, we planned for avoiding built-in stresses and cracks by sliding the longitudinals into exact pre-cut openings in transverse webs and bulkheads, thus avoiding the welding of lugs across larger openings. We obtained a better ship in this respect, but it meant a more challenging and much more cumbersome production method for the yard.

"Not knowing what the regulations would require, we decided to build the inner hull as strong as the outer one. We specified a ship with a capability of withstanding raking damage over 75 per cent of the length, quite

in excess of the class requirements. The forward bottom, shell and structures were reinforced to withstand slamming at shallow draft. We normally add a corrosion allowance of 1 mm to the class requirements for steel thicknesses; this we did also for the deck of the AROSA, but we added 1.5 mm to side and bottom platings as it was not that much more expensive. The height of the double bottom was set to three meters and the width of the side spaces to 2.44 metres, which later became the norm. Stringers at three

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levels of the ballast tanks were arranged also to function as platforms for inspection and maintenance, and we thought of ease of evacuation in case of an injury. For the side longitudinals we did not want to use asymmetrical frames, which are better for draining and cleaning, but have less resistance to buckling. We decided on symmetrical frames, although that was not shipyard standard.”

Knowing that cracks are quite common in large oil tankers we could not resist asking Mr Vagliano how many cracks had been detected on board the AROSA over the years. “Under the responsibility of the Captain, we carry out inspections of all spaces twice a year”, informed Vagliano, “and we have only found two cracks, both of rather insignificant importance and both dealt with a long time ago.”

On the subject of coating, Vagliano underlines the need for good preparation of the steel, removal of welding spatter, grinding uneven surfaces of welds and grinding all edges of all cut steel. “Normally specifications require all plasma cut surfaces to be ground by one stroke of a grinding machine, but we asked for three strokes, grinding also the edges after the first grinding stroke. That, and the excellent protection offered by a good tar epoxy coating, applied under favourable conditions, is the base for the success in our ballast tanks. We did two stripe coats and three full coatings in the ballast tanks, and we fitted anodes as well. Starting six months after delivery, we have had fitters continuously engaged on board, searching for blisters and upgrading and maintaining the coating. The coating inspection is carried out under the responsibility of the chief

officer. It is a never-ending job; we have a highly valuable ship to take care of.”

“We have studied paint systems a lot”, continues Vagliano, “and we are sorry to see the tar-epoxy types disappearing, as they were really good in ballast tanks. One of the ships managed by Neda from newbuilding, a clean product tanker, was sold last year, 21 years old. We do not normally see a vessel kept quite that long, but when sold she held a CAP 1 rating by class, having passed the fourth special survey without any steel renewal. That is rather unusual. The original coating in the ballast tanks was 95 per cent intact. The cargo tank coating was 100 per cent intact with maintenance”

The so-called Dresser couplings for pipes are known to last about 15 years or often less in a ballast tank, depending on the coating and on sacrificial anodes. Vagliano wanted a more permanent solution and had noted the Denso wrapping material at an offshore exhibition back in 1973. All pipe couplings in the ballast tanks of the new-building AROSA were wrapped with Denso tape, as well as all important valves and pipe couplings on deck. An expensive method, one may say, but it is not at all as expensive as changing a large number of valves and couplings, as has been done in so many ships coming of age. “We cut open a wrapping in a ballast tank once”, informs Vagliano. “That was not necessary; the coupling underneath was like new.”

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The owner also gave the yard many operational challenges during the process of planning the vessel, one being a demand for de-ballasting the large tanker in maximum 15 hours, on an even keel. Ballast pumps of more than normal capacity were used, and an ease of flow of water to the suctions was provided for. “We did not save on the capacity of main engine, generators or any piece of machinery” Vagliano ends, “so AROSA is ready to stay in shape also when coming of age”. ■



Valves and flanges on deck are wrapped with Denso tape to avoid corrosion. The photo shows a deck valve in a crude oil washing line.