

Sembawang Shipyard – The LNG Carriers Repair Shipyard

Sembawang Shipyard has always pride itself for its ability to innovate and create, to adapt and transform to meet the needs of the industry, and to exceed the expectations of its customers. We have thus continuously build up and improved our LNG repair capabilities and facilities over the last two years, in order to provide world-class services to LNG carrier owners and operators. Today, we are proud to be a leading shipyard in this specialised niche market.

One of the milestone developments is the signing of a Service Agreement with Gaz Transport Technigaz (GTT), the original maker of the GTT containment system, in December 2000, to enhance our capability and expertise on LNG carriers' repairs. Through this technical collaboration, we are able to leverage on GTT's expertise and know-how of the design, technique, maintenance of these specialised membrane system. Additionally,

under our technical services agreement with GTT, our dedicated LNG team is trained on membrane repair techniques, design, repair procedures and all environmental, safety and preparatory works required for LNG carriers, especially for the cargo tanks repairs. Our dedicated team of welders and platers are also trained and certified accordingly to GTT procedures.

In terms of facilities and infrastructural improvement, we invested in the set up of a dedicated cryogenic mechanical workshop in 2002, which caters for the refurbishment and repairs of LNG cryogenic equipment such as cargo pumps and valves, in a fully air-conditioned environment, using specialised tools and specially trained workers. The workshop is also

equipped with ultrasonic chemical cleaning facilities.

Since 2000, we have successfully repaired nine LNG carriers for leading LNG owners and operators such as our alliance partner, Shell International Shipping and Trading Co Ltd (UK), Hoegh Fleet Services (Norway), North West Shelf Shipping Service Company (Australia), Mitsui OSK Lines (Japan) and Malaysian International Shipping Company (Malaysia).



Overview of an LNG carrier.



Aman Hakata.



Fully airconditioned cryogenic workshop.

Our most recent success was on the repairs on 10,951 dwt LNG carrier *Aman Hakata* in May 2003. The vessel is owned by Petronas Tankers Sdn Bhd, Malaysia and managed by Malaysian International Shipping Company (MISC). The vessel was awarded to us after a closed tender exercise conducted by MISC LNG Liaison Office in Japan, which is the managing office of the vessel. MISC conducted a pre-award Management System audit on Sembawang Shipyard in April and their audit team was impressed by the shipyard's systems, procedures and repair facilities put in place for LNG carrier repairs.

The vessel carried out its first special survey in the shipyard, including underwater survey, leading to hull coating, measurement of stern tube and rudder clearances and anchor chain calibration works. Among the other works carried out during the refit were the overhaul of cryogenic valves, cargo pumps, compressors, motors, cargo tank level gauging and main boiler, and the renewal of cargo and steam pipe insulation. We also conducted the Global Tank Tightness Test on the GTT Mark III

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design membrane system on the vessel. We have the distinction of being the first shipyard in Southeast Asia to perform the test on this new tank design.

Other significant LNG repairs

carried out by our dedicated LNG project team in 2002 include the *Al Wakrah* from Mitsui OSK Line (Japan), *Northwest Swift* from NYK Line (Japan) and *Puteri Nilam* from Malaysia International Shipping Corporation (Malaysia). Besides the standard docking and repair work, other major works carried out on the *Northwest Swift* include the overhaul of cargo pumps and compressors, custom transfer system and the repairs and overhaul of the vessel's turbine system. Substantial work was also carried out on the *Puteri Nilam* such as hull blasting, coating and underwater survey, trunkway hydro-blasting to 30,000 psi, boiler cleaning and survey, and overhaul of four desuperheaters. The shipyard also successfully carried out global testing for all cargo tanks. The *Al Wakrah* had its turbine gearing overhauled and we provided skilled workmen to the MHI specialist for the overhaul of the turbine gear including the repairs of the LP flexible coupling.

We are acutely aware of the critical Quality, Health, Safety and Environment (QHSE) requirements as well as salient technical know how and skills for the successful

refits of LNG carriers and we will continuously strive towards exceeding the exacting requirements of LNG owners and operators. Currently, we are in the process of setting up a dedicated storage location for LNG

equipment, which would allow sensitive equipment to be preserved and stored in the shipyard under proper protection, while awaiting the arrival of the LNG ships into the shipyard for repairs. ⚓



Northwest Swift.

Our LNG Carriers' Track Record at a Glance

Year	Vessel
2003	Aman Hakata
2002	Al Wakrah Northwest Swift Puteri Nilam
2001	Northwest Shearwater Hoegh Galleon Havfru
2000	LNG Port Harcourt LNG Bonny
1986, 1989, 1991, 1993, 1997	Hoegh Gandria
1979, 1980, 1982, 1983, 1986, 1989, 1992	Norman Lady
1982	LNG Gemini LNG Aries
1980, 1981	LNG Virgo
Twice in 1980	LNG Taurus
1980	LNG Libra
1979	LNG Leo

Accolades from our customers :

"On behalf of the International Gas Transportation Company and the North West Shelf LNG Project, I would like to thank Sembawang Shipyard for its excellent performance during the recent docking of our LNG carrier, **Northwest Shearwater**.

The required work was completed in a safe and professional manner and by providing us access to your facilities and people at a short notice, you have allowed **Northwest Shearwater** to maintain her very busy schedule of delivering LNG to our many valued customers in Japan.

Thank you once again for a job well done"

Northwest Shearwater
Mark Ross, General Manager
North West Shelf Shipping Service Company
Pty. Ltd., Australia

"We are surprised and happy with the creation of the new clean workshop for cryogenic repairs which is an excellent facility.

I am impressed with the shipyard's dedication to prove its seriousness in penetrating the LNG repair market with such investment...

Congratulations to everyone in the team; through hard work, commitment and dedication, has made the refit project of **Northwest Swift** a very successful one."

Northwest Swift
K. Iwanaga, Site Manager
NYK Line, Japan

" I am pleased with the overall arrangement and effort put such as control measures at the cargo tank entrances. The shipyard's design of the "dog houses" for cargo tanks entrance was excellent...the sentry

arrangement at each tank entrance to control and monitor the movement of personnel and tools / materials in & out of the cargo tanks was effective.

I would like to thank the entire project team for delivering good work on time and with good quality. I would recommend the next vessel to be drydocked in your shipyard."

Norhisham Soin, Superintendent
Malaysia International Shipping & Company,
Malaysia

" Investment by the yard towards catering for LNG vessel stringent requirements shows not only efforts but also commitments of the yard to provide better facilities to its service".

Mohd Rafe Bib Mohamed Ramli,
Technical Manager
MISC LNG Liason Office, Japan