



Saga Dawn is the first LNG carrier to be fitted with an LNT A-box cargo containment system

New mid-size LNG carrier ‘contains’ a big innovation

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Saga LNG Shipping's new LNG carrier is the first with an LNT A-Box cargo containment system, using an IMO independent type A tank



With its gas trials successfully completed in June, Singapore-based Saga LNG Shipping's new mid-size 45,000 m³ LNG carrier *Saga Dawn* has broken new ground with its LNT A-Box cargo containment system, based on an IMO Independent type A tank.

Conducted in June over three weeks, the gas trials cooled down one of the LNGC's three LNT A-Box cargo tanks before loading 2,300 m³ of LNG at Shanghai LNG's Wuhaogou terminal.

The trials covered a full cool down and warm up of all three cargo tanks and tested the 11,700-kW Wärtsilä dual-fuel main and auxiliary engines, gas combustion unit and cargo handling equipment. Immediately following warm up, each tank successfully completed global tightness testing to confirm the integrity of the secondary barrier system.

The testing was witnessed by representatives from Chinese shipyard China Merchants Heavy Industry (CMIH), class society ABS, cargo containment system designer LNT Marine and Saga LNG Shipping.

LNT Marine chief executive Kjetil Sjølle Strand calls the gas trials a "remarkable achievement in LNG shipping", noting: "The success of the gas trials – the culmination of nearly 10 years' research and development – verifies that the LNT-A Box concept is a viable solution for flexible LNG carriers."

Due for delivery in July, *Saga Dawn* is based on LNT Marine's LNT45 design, with Sweden's FKAB supplying its basic design.

Built with an Independent tank type A as the primary barrier and a full secondary barrier, the LNT A-Box cargo containment system is flexible in shape and geometry, maximising volume utilisation, while its internal structure mitigates sloshing and eliminates any loading limitations.

The tank itself is not insulated, but it is installed in an insulated cargo space. This means that the insulation is attached to the interior surface of the hold, while a liquid-tight barrier is fitted on the inner surface of the insulation acting as the secondary barrier. In between the tank and the secondary barrier is a cold inter-barrier space, which offers direct access for visual inspections and maintenance of both barriers, as well as the tank supports.

Since the insulation is not exposed to any static or dynamic loads from the cargo, the insulation material is optimised for thermal performance. This means that the LNT A-Box system can offer a boil-off rate (BOR) of 0.15% per day, according to Saga LNG Shipping.

Saga LNG Shipping's first LNG carrier, *Saga Dawn* has an overall length of 195.3 m, beam of 30 m and design draught of 9 m.

With a service speed of 16.5 knots, the LNGC is powered by a single Wärtsilä dual fuel main engine that mechanically connects to a single shaft and propeller. The ship's auxiliary generator sets are also able to burn natural gas.

Saga LNG Shipping and CMIH signed a contract for the 45,000-m³ capacity LNG carrier in late 2015, with the yard subsequently entering into a licence agreement with Singapore's LNT Marine for the LNT A-Box containment system.

LNT Marine COO Stein Foss believes the cost and complexity of traditional LNG containment systems does not make smaller LNG projects commercially feasible. "LNT A-Box does", he states. "It offers a simple, flexible and efficient cargo containment system enabling more shipyards to build LNG vessels at more attractive prices."

While the concept has initially been focused on the small-to-mid-size LNGC segment, Mr Strand says the technology can be scaled up or down. "We are currently involved in a number of projects to develop new LNGC designs based on the LNT A-Box concept, including an 80,000-m³ LNG carrier, shallow draught vessels and small and mid-size FSRUs", he adds.



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