

Tanker is converted for dual heat capability in 10 days

Having entered into service with a cargo heating system entirely supplied by steam, Stolt-Nielsen decided that over half of the tanks on *Stolt Sneland* should be converted to thermal oil, and that the work should be undertaken by a turnkey supplier

Stol *Sneland* is the second in a series of six chemical tankers ordered by Stolt-Nielsen from Aker Yards' (now STX Europe) Florø site in Norway. Each ship has been designed to have a cargo capacity of 44,500m³ spread over 39 tanks (24 stainless steel, 15 coated). The lead vessel, *Stolt Sagaland*, was delivered in February 2008 and recognised by *Tanker Shipping & Trade* as one of the ships of that year.

When *Stolt Sneland* was delivered the ship had a heated hot water system based on the cargo tanks' stainless steel coils. The setup allowed for hot water to a maximum temperature of 150°C to be supplied. Steam was raised in two boilers located in the engine room with the heat exchangers in a dedicated space located forward of the engine room, below the main deck.

One of the limitations of a hot water heating system is that it narrows the range of cargoes that can be carried. Those chemicals which are combustible on contact with water are clearly prohibited.

In order to extend the cargo carrying range, and therefore revenue generating potential of the vessel, Stolt Tankers decided that the stainless steel tanks should have the capability of heating with two media: hot water and thermal oil. The company specified that both the hot water and the thermal oil were to be heated by the steam system at 10 bar via dedicated heat exchangers. The supply temperature of both systems was specified as 150 °C in line with what was available before.

The additional system also called for the installation of a 2,000 litre expansion tank and a 5,000 litre drain storage tank. Both were to be located on top of the midship deckhouse.

As this vessel makes heavy usage of nitrogen to inert onboard spaces, it was decided to put the storage, drain and expansion tanks under Nitrogen blanketing. This has two advantages: should there be any leaks from the heating coils, thermal oil will seep into the cargo, which means the level in the expansion tank will fall and a low level alarm will be activated. On the other hand,



New Expansion and drain storage tanks are positioned on top of the midship deckhouse

with a nitrogen blanketing air can not enter into the system, which has a positive effect on the life time of the oil, as contact with oxygen has an aging effect on the oxygen. Pressure levels in this part of the ship are between 1 and 1.5 bar.

Stolt Tankers engaged Rotterdam-headquartered Heatmaster to act as the turnkey supplier on the project. The contract was fulfilled and approved by DNV in nine days.

"This was a challenging project as the new equipment had to be installed in and around existing systems," recalls Heatmaster's managing director, Gert van den Hof. "Each heating coil needed to be capable of being heated by both hot water and thermal oil. To do this we made a T-piece with a double connection so that the tank could be heated either by hot water or thermal oil. A spectacle plate



View of the new above the existing header. Also on view are the shut off valves for the individual heating coils

between these systems in the blanked position was fitted to prevent any cross-contamination between the hot water and thermal oil."

An added challenge was integrating the new 127mm copper 90/10 main deck lines now required into the existing system. "Normally, copper and oil are not compatible because copper has an ageing effect on oil," said Mr van den Hof. "However, this was the owner's requirement as copper is absolutely sea water and corrosion resistant and can be expected to last the lifetime of the ship.

"Following extensive discussions with DNV, we realised we could mitigate the copper's impact on the oil by eliminating other potential sources of ageing, such as contact with oxygen by hermetically sealing the pipes."

In order to meet the tight deadline Mr van den Hof assembled three teams of welders: one team worked on the main line, one on the header tanks and one on the pumps and tanks inside the vessel.

"With the exception of deck or bulkhead penetrations, there is not one flange in the thermal oil system, which is in line with DNV's requirements. From a practical point of view, this meant that everything has to be welded. We had to take into account the fact that our teams and the materials were exposed to the elements throughout the life of the job."

With Stolt satisfied with the results, Heatmaster will start work on a second vessel in the series imminently, with a view to a third in the summer. **TST**