



## Chemical Tanker Conversion: Hot-Water Cargo Heating

### General:

Vegetable/edible oils - the revisions to MARPOL Annex II and the IBC Code.

An engineering assessment and complete Basic Design, including all necessary calculations and sizing of expansion tank has been carried out by KNUD E. HANSEN for a new cargo heating system on the chemical tanker (IMO 2-type) vessels MT. HARBOUR CLEAR and MT. HARBOUR CLOUD.

The client wished to extend the cargo carrying list by enabling the vessels to carry edible oils. Originally the vessels were equipped with one exhaust gas thermal oil economiser and two central thermal oil heating boilers; supplying heat to engine room, the cargo tank cleaning heat exchanger and the cargo tank heat exchanger. The cargo tank heat exchanger was used to heat thermal oil, which is circulated in cargo heating coils to heat the cargo. When carrying edible oils the heating of the cargo is normally using coils containing pressurised hot water instead of thermal oil.

On an IMO 2-type chemical tanker it is required by Class to have a physical split between the cargo part and the "heat producing" part of the system, by means of for example a heat exchanger to avoid the risk of flammable liquids reaching the oil fired heater (in the case of any leakages in the heating coils).

The engineering assessment was conducted to clarify the main technical issues and cost optimal solutions when modifying the cargo heating system in order to allow the vessels to carry edible oils. During the Basic Design stage all necessary drawings for Class approval and calculations on heating balance, pipe system, pressure tanks etc. were carried out for equipping the vessels with pressurised hot water cargo heating.

When applying hot water cargo heating systems it is important to design a pressurised system. In the pressurised system the boiling temperature of water shall be increased with due consideration to the heating surface.