

## Rebuilt Dutch-owned pelagic giant Willem van der Zwan to...



THE PELAGIC freezer trawler *Willem van der Zwan* (SCH 302) will boast the largest onboard refrigeration system in the world when her high-profile reconstruction is completed this month, writes **Ewen Cook**.

The 143-metre giant, owned by Dutch company Rederij W. van der Zwan & Zonen B.V., is in the final stages of being rebuilt at Scheldepoort Shipyard in Vlissingen, the Netherlands, following extensive damage more than two years ago.

A large fire broke out at the end of a major refit of the trawler in January 2007, almost completely destroying the ship.

The date of her eagerly anticipated re-entry into fishing is "the best kept secret in the Netherlands," Gerard van Balsfoort, president of the Pelagic Freezer-Trawler Asso-

ciation (PFA), told *FNI* last month.

However, W. van der Zwan has announced that its flagship will be ready "by July 2009."

The contract to build and install the vessel's state-of-the-art, environmentally-friendly, refrigeration plant was awarded to GEA Greenco Marine, the specialised marine department of Dutch firm Greenco B.V.

The order, carried out over ten months, is the biggest in the company's history and is worth several million euros, *FNI* is told.

GEA Greenco once again combined with Dybvad Stål Industri (DSI), the Danish plate freezers specialist, to build an ammonia (NH<sub>3</sub>) and carbon dioxide (CO<sub>2</sub>) based refrigeration system.

The plant features 48 DSI

vertical CO<sub>2</sub> freezers and is capable of freezing 500 tonnes a day and is 30% more energy efficient than traditional systems, GEA Greenco claims.

Simon Kortleven, sales engineer for GEA Greenco, tells *FNI*: "The SCH 302 previously operated with Freon (R22), but as of January 2010 such installations cannot be refilled with newly-produced R22. After 2015 it will be illegal to use R22 at all, according to EU regulation.

"The new installation will use carbon dioxide and ammonia which are so-called natural refrigerants. Using natural refrigerants means a considerable effort is made to reduce the greenhouse effect and the depletion of the ozone layer.

"Furthermore, considerable

energy savings will be achieved by installing this new system. The total energy savings amount to 30% compared to the energy consumption of the originally-installed plant."

DSI's CO<sub>2</sub> freezing plate was designed by DSI with help from Per Skærbaek and Thomas Lund in 2000. DSI and GEA Greenco have since co-operated on several marine CO<sub>2</sub>/ammonia cascade refrigeration plants for the Dutch trawler fleet.

"DSI is the only company which can offer a specially designed freezing plate for CO<sub>2</sub>. The plate is designed to obtain the highest performance with CO<sub>2</sub> freezing technology," sales director Peter Nygaard Christensen tells *FNI*.

W. van der Zwan placed its first order for a CO<sub>2</sub>/ammonia refrigeration plant for *Ocean 7* in 2003. It was the first CO<sub>2</sub>/ammonia plant delivered by GEA Greenco and included five DSI vertical plate freezers.

Peter Nygaard Christensen says: "All DSI-Greenco installations have shown great improvement with regard to reduction in freezing times: from 25-50% compared to a standard installation with Freon or ammonia at -38 deg. C compared to CO<sub>2</sub> at -50 deg. C.

"It is also possible to achieve a higher freezing capacity with the same number of freezers, or the same capacity with less freezers, saving space in both onboard and on land installations."



# FREEZE 500 TONNES A DAY!

The rebuilt Dutch pelagic freezer trawler *Willem van der Zwan* (SCH 302) will boast a state-of-the-art, environmentally-friendly, refrigeration plant (inset left).



Picture: Rederij W. van der Zwan & Zonen B.V.

## Packing line for 15,000 blocks

AFAK Techniek of Katwijk aan Zee, the Netherlands, won the order to build and install *Willem van der Zwan's* fish processing plant.

Managing director Buis Van Velzen tells *FNI* that he was delighted to receive such a high-profile contract and explains how the plant will operate: "AFAK is very happy the owner gave us both the order and the trust to deliver this large installation. Thankfully, we were not on board during the dramatic fire. We began the engineering work in February 2008 and, later in the year, started with installing the equipment.

"We are responsible for the pumping, grading and conveyor systems, freezer logistics and packing lines. The AFAK system provides vacuum pumping

from the vessel's RSW tanks to the processing deck, followed by grading on a roller grader GM-14-4 with a capacity of 30 tonnes an hour.

"After grading there are six cooled buffers to store graded fish before freezing. Frozen blocks are then packed into foil and cartons by the AFAK sealing machine type DV 15 and an AFAK packing machine type FV 15.

"Each packing line can produce up to 15,000 blocks a day. Strapping, ink jet marking and weighing are carried out after packing by Strapex, Domino and Marelec equipment respectively.

"Finally, by means of four block lifts, we are able to transport blocks to the fore and aft in the freezing holds."



E. & R. Refrigeration installed the chilling, flake and slurry ice systems in the fishroom of *Endeavour IV*.

## Fish chilled three ways on new twin-rigger

SCOTLAND'S latest twin-rig stern trawler *Endeavour IV* built by Macduff Shipyards relies on slurry and flake ice, plus fishroom chilling equipment, to deliver optimum fish quality, writes **David Linkie**.

Skipper Peter Lovie's 29 metre whitefish-catcher has two hydraulically-operated ramp gates topped with large diameter rollers fitted at the head of the stern ramps, astern of two similarly operated shelterdeck hatches that serve a large single fish hopper.

The hopper is fitted with internal baffles to minimise fish damage in heavy weather.

Fish released from the codends into the hopper are moved forward on an elevated conveyor along



The machinery for the slurry ice system aboard *Endeavour IV*. Up to 15 tonnes of slurry ice at 10°C is produced every 24 hours by an S8 system supplied by Slurry Ice Systems Ltd. (SIS) of Scotland.

the centreline of the vessel from where crewmen select and gut the catch. Guttled fish are placed into elevated stainless steel selection bins. When full, the contents are released into an integral washer, from where a second conveyor takes the cleaned fish forward. They are delivered by chute

to a receiving hopper in the 210 cu. metre fishroom which can accommodate 1400 boxes.

A separate tray is used to lead smaller fish across to a Kronborg gutting machine, from where they enter the main washer. Fish are then weighed on a set of Wave/Cheetah electronic scales by Mesco Weighing of Hull, England, before being stored in a combination of 880 litre bins and nealstack boxes.

*Endeavour IV's* tween deck fish handling area is fitted with four bunks, each of which is served by Spanish-made Bombas Azcue vertical vortex motor-driven pumps.

Realising optimum catch quality is a top priority for Skipper Peter Lovie who, with *Endeavour III*, is a member of the Sea

Fish Authority (SeaFish) Responsible Fishing Scheme.

As a result, *Endeavour IV* features three forms of fish cooling installed by James Erick and Gordon Robertson of E. & R. Refrigeration Ltd. of Fraserburgh, which also fitted air conditioning equipment for the accommodation areas and a milk machine.

The fishroom – served by an electrically-driven three-phase condenser unit chilling system – includes 7/8 in. stainless steel pipes fitted to the underside of the deckhead.

Smaller diameter copper pipes, protected by galvanised sheathing are mounted to the fore and aft bulkheads, as well as the hull sides aft of the ice lockers.

This high level of



fishroom cooling will ensure that maximum benefit is gained from storing fish in a combination of both flake and slurry ice from systems installed and commissioned by E. & R. Refrigeration Ltd.

A French-made Ganeglace plant housed in a machine room on the port side of the main deck delivers 2.5 tonnes of



*Endeavour IV's* stern hopper.

Left: whitefish are selected and gutted off the main centreline conveyor and then enter an integral washer.

from the buffer tank through one of two hoses to points in the fishroom for delivery into both boxes and bins.

The use of slurry ice, which flows freely into the voids around stored fish to provide rapid chilling, greatly improves the quality of fish delivered to the shore and the shelf life. *Endeavour IV's* slurry ice

system has the capacity to also supply the receiving hopper to keep fish cool during summer.

Following similar installations on the Peterhead pair seiners *Harvester* and *Ocean Harvest*, this is the third S8 system SIS has supplied to Scottish vessels in the past year.

Report on *Endeavour IV* – pages 42 and 43.