Job report

HVAC EQUIPMENT

P17 SHIVALIK CLASS FRIGATE FOR THE INDIAN NAVY

Customer Mazagon Dock Ltd. (MLD)

SHORT DESCRIPTION OF THE PROJECT

The P17 Shivalik Class Frigate project consists of three multi-purpose frigates built at Mazagon Dock Ltd. (MLD) in Mumbai, India for the Indian Navy. The frigates are 143 m long with a breadth of 16.9 m and a total displacement of 4900 ton. Novenco has designed and delivered the main HVAC components for the project such as Air Handling Units, Fan Coil Units, Cabin Units and NBC Protection Units.

CHALLENGE

Size – as hull and superstructure of the ships were already built. All equipment had to get through doors and hatches with a maximum size of 800 x 600 mm for mounting on board the frigates.

Shock – the equipment had to be tested according to Indian Shock Grade A. This is one of the toughest shock standards used at all (approx. 250G).

Detailed technical specification – The Indian Navy and the design team from the yard MDL had done a thorough design study and written a detailed technical specification for procurement. The space envelope for each unit was also fixed and Novenco had to customise the products to a great extent.

SOLUTION

Novenco had to modifie the series of our Air Treatment Units (ZNA), Heat Exchangers (ZNB) and Air filtration Units (FNA).
A survey of the ship was conducted by Novenco, and the transport route and maximum size of each unit were recorded. The units were then designed so they could be taken apart and reassembled on board.

New software for shock analysis was procured and three prototypes were full-scale shock tested in spring 2006 at QinetiQ in Scotland. All units passed the test without any problems.

A lot of work was done to optimise the selection and performance of the equipment (mainly the cooling coils and the fans), to achieve the needed capacity within the space available. This was done through close cooperation between Novenco and the customer (MDL and the Indian Navy).
All tests (Shock Test, Factory Acceptance Test and Performance Test) were witnessed by Lloyd's Register.

SCOPE OF WORK

All the main equipment was modified for this project.
The main equipment was:

Air Treatment Unit (ATU) ZNA – A shock resistant unit made of aluminium. It is possible to disassemble the unit for transportation in order to be reassembled on board.

Heat Exchanger (HE) ZNB – A fan coil or heat exchanger made of aluminium, shock proof and small enough to be transported through doors and hatches.

Air Filtration Unit (AFU) FNA – Used in NBC mode to filter the fresh air that is supplied to the citadel. This unit is also shock proof and made of aluminium. Novenco also delivered most of the other equipment needed for the NBC protection, including the control system designed and built by Novenco.

MS50X Diffusers (Cabin Units) – A larger cabin unit was developed especially for this project.

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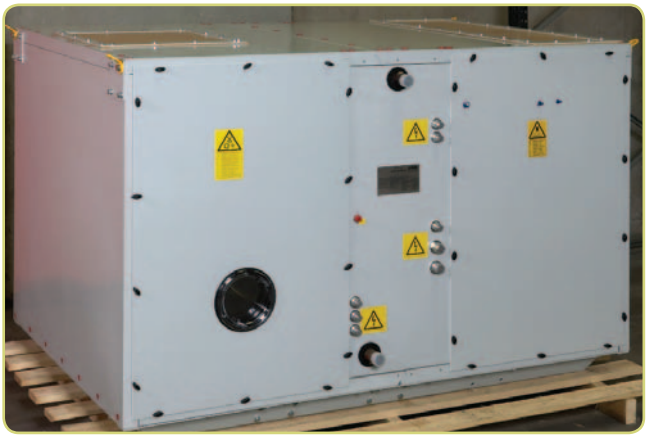
TECHNICAL DESCRIPTION OF THE EQUIPMENT

AIR TREATMENT UNIT - ZNA

With air volume ranging from 1200 to 10,200 m³/h and a cooling capacity ranging from 10 to 85 kW, the ZNA Air Treatment Units were customised to meet the specification from MDL and the Indian Navy.

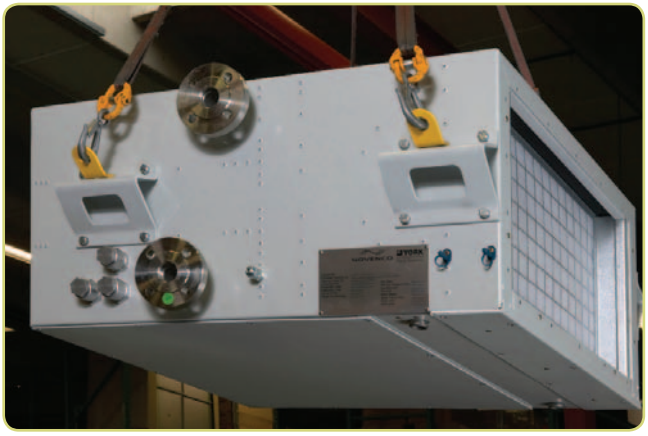
The units are made of double skinned panels from aluminium alloy with internal reinforcements of aluzinc steel.



HEAT EXCHANGERS - ZNB

The ZNB range of heat exchangers (fan coils) was also developed for this project. Capacities range from 1200 to 3200 m³/h with a cooling capacity ranging from 10 to 26 kW.

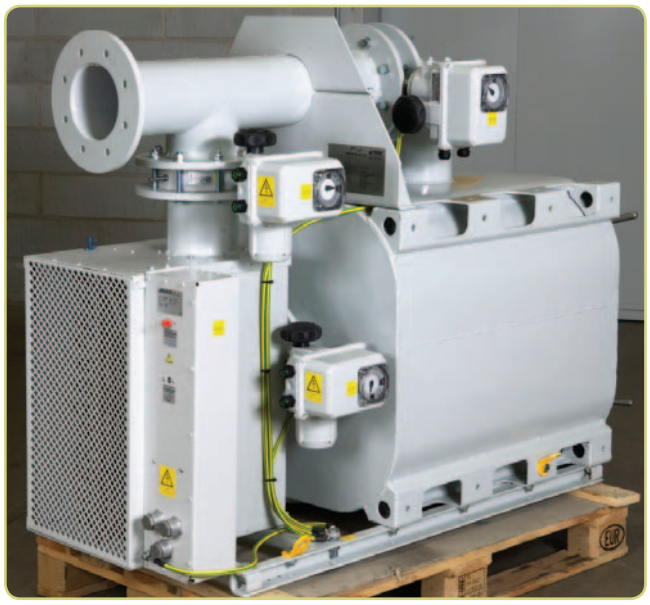
The units are made of an aluminium alloy casing with internal reinforcements of aluzinc steel. The units are designed for deck-head mounting.



AIR FILTRATION UNIT - FNA

The FNA unit is developed on the basis of the unit which Novenco has delivered for the Norwegian Skjold class, but for this project. Novenco has been responsible for the complete system (fan, valves, control system, etc).

The unit was delivered in two sizes, 900 m³/h and 1800 m³/h filtered air. It was as all the equipment constructed in aluminium alloy.



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