Application Literature
Case History

FPSO Topside Plate Heat Exchanger Sends Shell & Tube Unit Ashore

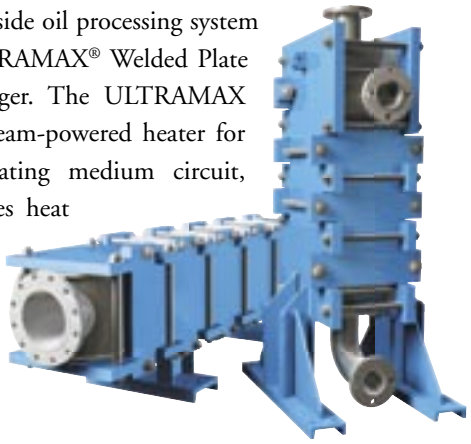
The ULTRAMAX® Welded Plate Heat Exchanger delivers a compact, durable oil heating solution for a hostile marine environment.

Space and weight are critical factors for efficient operation of Floating Production Storage and Off-loading (FPSO) vessels. FPSOs are designed to relieve offshore oil platforms of large quantities of crude oil as it is produced. FPSOs then process and store the oil until it can be offloaded onto tankers or sent through a pipeline. FPSOs are particularly utilized in remote or deepwater locations where long-distance, seabed pipelines are not cost effective.

FPSOs typically use a variety of heat exchangers to provide heat for oil production as well as maintain a constant temperature for oil storage and other oil operations. One FPSO sought to greatly reduce the space required for conventional HEs, which are often large and heavy. Turning to Tranter, the customer requested a compact plate heat exchanger that could meet the required duty and withstand the harsh marine environment.

More than a small footprint

The customer replaced a shell & tube HE in an FPSO topside oil processing system with an ULTRAMAX® Welded Plate Heat Exchanger. The ULTRAMAX serves as a steam-powered heater for the local heating medium circuit, which supplies heat for various processes throughout the vessel.



The ULTRAMAX® Welded Plate Heat Exchanger performs reliably in corrosive environments.

Selecting the ULTRAMAX offered several distinct advantages to the FPSO vessel. Its compact size, significantly less than tubular heat exchangers, easily fit within the vessel's minimum space requirements with less weight. The ULTRAMAX measured 45 in. (1,143 mm) by 45 in. (1,143 mm) by 45 in. (1,143 mm) and weighed only 6,000 lb (2,722 kg). With its high heat transfer efficiency, the ULTRAMAX requires only 30–50% of the space and up to 70% less weight compared to other exchangers. This efficiency also means less steel, lower purchase price, shorter lead time and less expensive delivery.

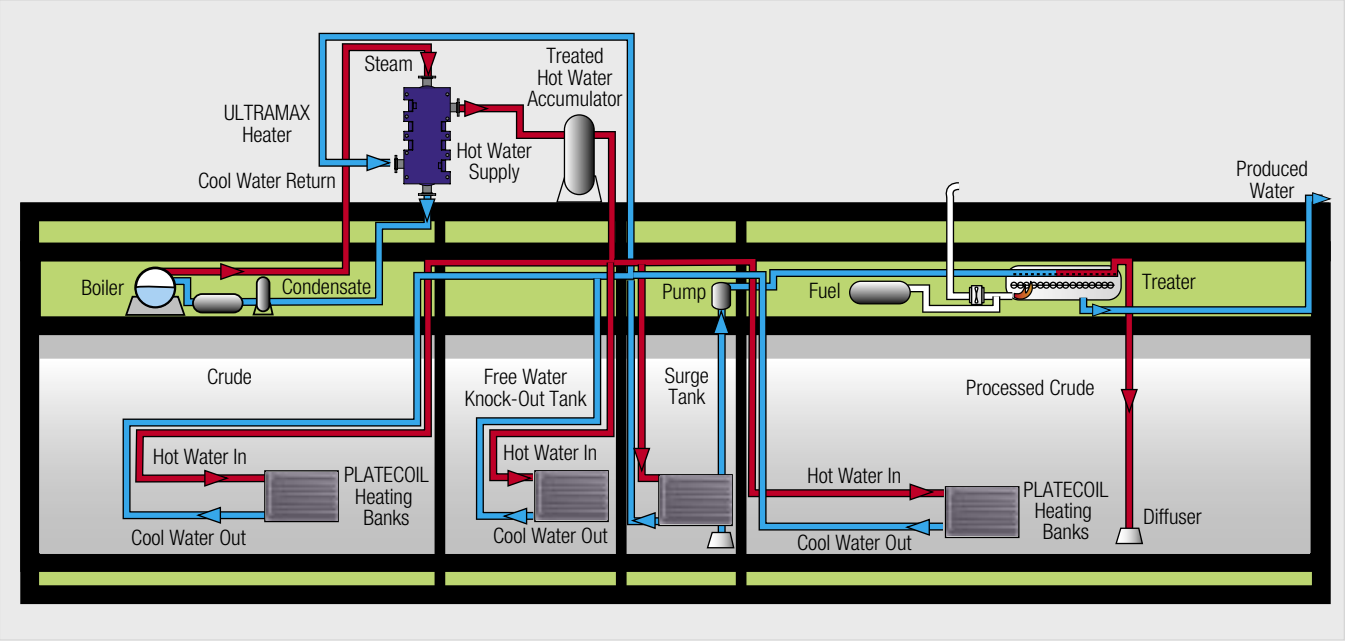
Moreover, the ULTRAMAX combines the efficiency of gasketed plate heat exchangers with the integrity of a welded design. The ULTRAMAX heat exchanger is designed for pressures to 45 barg (650 psig) and at temperatures up to 343°C (650°F) for standard range units. Extended range units are available for higher temperature and pressure applications. The compact ULTRAMAX has highly corrugated plates arranged to provide alternating hot and cool flow channels for true countercurrent or co-current flow. The plate surfaces provide very high heat transfer rates, close approach temperatures and a quick response to process changes. Highly turbulent flow resulting from these plate corrugations helps maintain clean heat transfer surfaces.

Reliable in hostile conditions

Reliability is a principal design objective for process systems on FPSO vessels, which do their work far from repair yards. The ULTRAMAX is protected against the marine environment by a PTFE coating and a special three-layer epoxy paint on all its tightening bolts. The PHE also offers the assurance of ABS certification and ASME Code stamps, as well as compliance with API662.

Superior performance for the long haul

The ULTRAMAX Welded Plate Heat Exchanger met the customer's design objectives plus offered excellent uptime performance, maintainability and durability in the marine environment. This is one of numerous ULTRAMAX units installed worldwide for similar processing duties.



The ULTRAMAX® exchanger reduces topside weight and footprint because of its outstanding efficiency compared to S&T units. Shown are typical processes served by treated hot water from the unit.

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