

Shell and Plate Feedwater Heater

Background

Welded shell and plate heat exchangers are a technological evolution from gasketed plate heat exchanger designs used in the power and other industries. Welded shell and plate designs are in use in several applications and are more compact than shell and tube designs. Their compactness is due to:

- High heat transfer coefficients inside the corrugated plate channels
- Counter-current flow arrangement

Westinghouse has collaborated with Tranter Inc., a well-known and proven welded plate heat exchanger manufacturer, to develop the modular shell and plate feedwater heater **SPFWH™** product for use in low pressure feedwater heater applications.

Description

In the SPFWH design, the heat transfer surface is comprised of corrugated heat transfer plates pressed from stainless steel sheets. The plates are welded together to generate cassettes which are coupled together to make up modules. Modules are welded together to form the core of the heat exchanger. The core(s) is contained within a shell with bolted, removable heads which permits access to 100% of the heat transfer plates and internals for easy inspection of the interior and removal/replacement of the plates if needed.

Benefits

The SPFWH minimizes the potential for component degradation and offers reduced inspection and maintenance costs compared to conventional Shell and Tube Feedwater Heaters. Key features include:

- Multiple points of plate-to-plate contact eliminates the need for vibration supports and minimizes the potential for Flow Induced Vibration (FIV)
- Thermally efficient corrugated heat transfer plates result in a compact arrangement with a significant (~50%) reduction in footprint compared to Shell and Tube designs
- Full access to shell side for visual inspection for compliance with Flow Accelerated Corrosion (FAC) programs
- Full access to heat transfer area. Plate modules and plates can be replaced and/or expanded at services or outages



SPFWH Core showing plates/cassettes/modules

Experience

Tranter Inc, has extensive operating experience with over 7000 shell and plate heat exchangers in operation. Westinghouse and Tranter Inc., have design, built and fully tested a prototype SPFWH as reported on in ASME Power 2014 conference paper 32248.

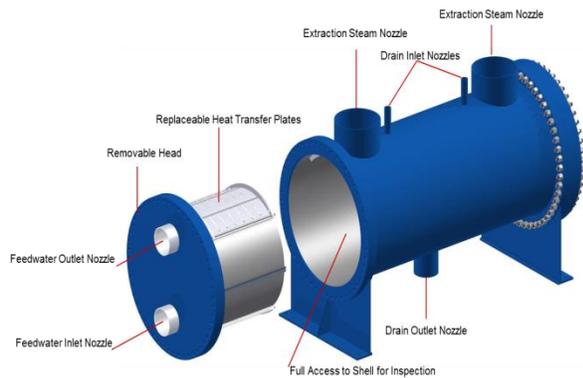


Illustration of SPFWH Low Pressure FWH

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