Tube liners save leaking heat exchangers

Leaking condenser and heat-exchanger tubes that have been plugged can be restored to service with a new process of relining. At one New York-area utility, 30 23-ft failed tubes were recently returned to service in a 45-yr-old unit. In another case, at a nuclear plant of a major utility, 500 tubes in a 50-ft-long heat exchanger were subject to failure from stress-corrosion cracking. These were also restored to service by tube lining. Tube liners may run the whole length of the heat-exchanger tube or part of the length, depending on the problem.

The lining process, which was developed by CTI Industries, West Haven, Conn, involves inserting a thin-walled liner into the cleaned heat-exchanger tube (see photo) and then expanding it into place by shooting a steel ball of precise size through it with a hydraulic pump.

Once in place, the end of the liner is trimmed flush with the tubesheet and roller-expanded to conform to the existing tube flare. If the liner runs the full tube length, both ends are expanded.

Calculations show that the reduction in heat transfer caused by the tube liner is less than 3%. This loss may be compensated for by the fact that plugged tubes are being returned to service. The lining process is also used on tubes that have been in service for a number of years and show a general wall thinning.

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