

Spray Attemperators

Purpose

The purpose of this bulletin is to advise customers and field personnel about superheater attemperator problems and provide recommendations for corrective action.

Background

The first B&W spray attemperator went into service in the mid 1950s. Since that time, design improvements have been made to extend attemperator life. These include adding a thermal sleeve and a material change. Figure 1 shows an early design attemperator.

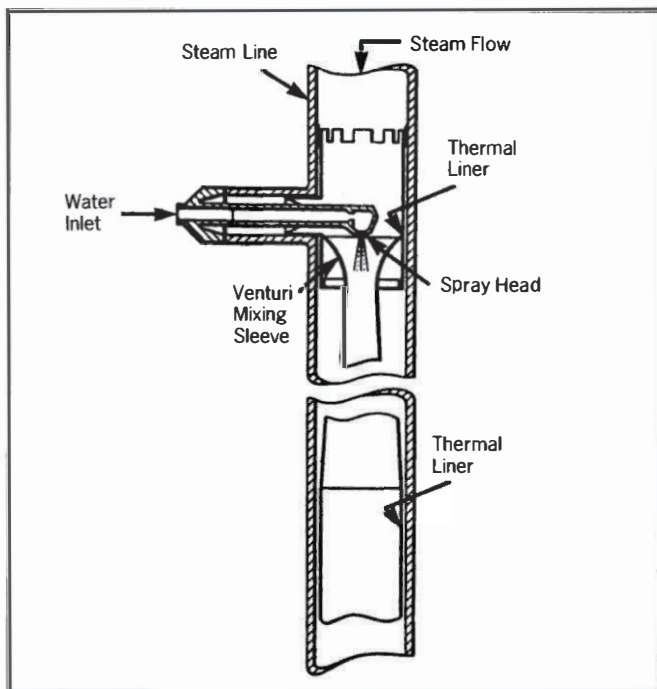


Figure 1 Spray attemperator.

Problem

A limited number of attemperator failures have occurred. These failures are mainly attributed to extensive temperature cycling and low spray water

temperatures. Some of the problems reported are as follows:

1. Cracks have been found in the early design spray nozzles.
2. Cracks have been found in or near dissimilar material welds on early design attemperators.
3. Spray nozzles have broken off and become lodged either in the Venturi or further downstream.
4. Cracks have been found in the thermal liners, and pieces have broken off and been found in downstream piping.

Figure 2 and Figure 3 show different views of a cracked spray nozzle. Figure 4 shows a cracked weld between dissimilar materials.

Warning

Tube pluggage may occur and cause localized overheating of the tubes if small parts break off and are carried downstream. Larger parts of the spray head can break loose and become lodged in the Venturi. This blocks steam flow, resulting in increased pressure drop and uncontrolled steam temperatures.



Figure 2 Nozzle crack.

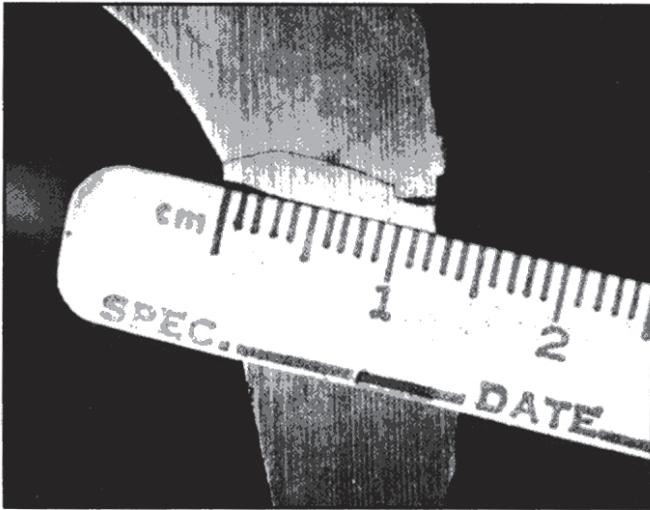


Figure 3 Nozzle crack.



Figure 4 Dissimilar weld cracks.

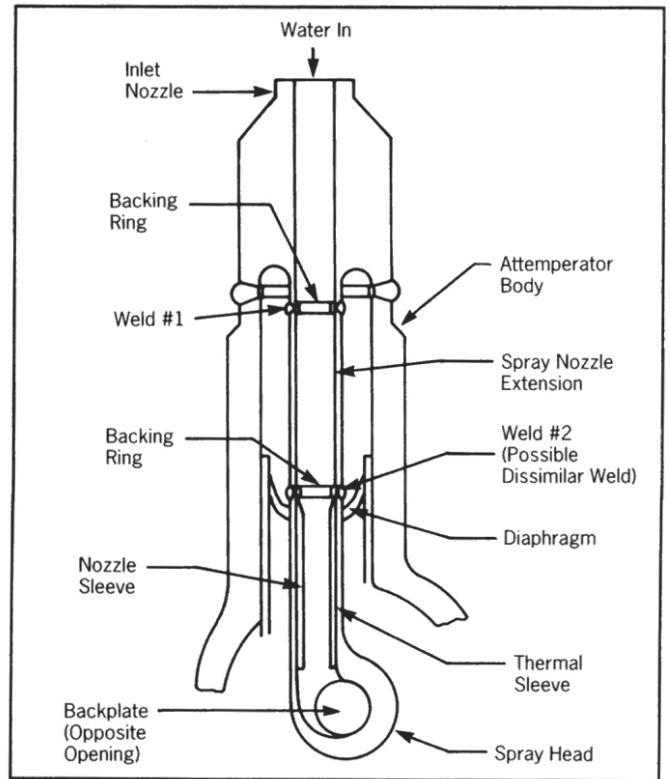


Figure 5 Spray nozzle assembly.

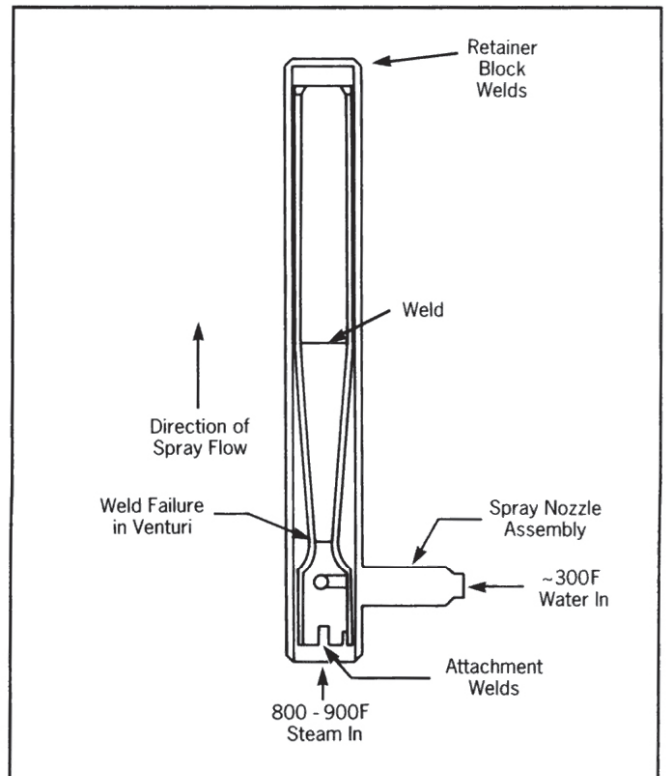


Figure 6 Cross section of attenuator assembly.

Recommendations

All attemperators should be inspected after 10 years of operation. The following areas should be included in the inspection:

1. Inspect spray nozzle assembly (Figure 5)
 - a. The diaphragm
 - b. Welds on nozzle extensions (welds #1 and #2)
 - c. Backplate
 - d. Inside and outside of spray header
2. Inspect the attemperator liner (Figure 6)
 - a. Check liner welds – circumferential and longitudinal
 - b. Liner retainer block welds

All areas should be inspected for cracks, cracked or broken welds, and cracked or broken nozzles, liners

and piping. Depending on observations made during the initial inspection, a schedule for subsequent inspections can be determined at that time. These inspections can be performed with fiber optics, or by removal of the attemperator. The results of the inspection will determine the extent of the repairs required. Complete replacement of the attemperator, in lieu of the repairs, may be a more economical alternative. The replacement attemperator should incorporate B&W's latest design, which includes material change to low alloy steels, eliminating the need for dissimilar welds.

Support

If any questions arise or assistance is required, contact B&W Field Service Engineering.

For more information...
In the U.S., call 1-800-BABCOCK (222-2625) or fax (216) 860-1886 (Barberton, Ohio). Outside the U.S., call (519) 621-2130 or fax (519) 621-2142 (Cambridge, Ontario, Canada). In Mexico, call (5) 208-1906 or fax (5) 533-5550. Or contact your nearest B&W sales or service office worldwide.

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