By Ed Sullivan

Full Stream Ahead

Multi-element strainers provide continuous full-stream protection with minimal backwashing or maintenance

Cooling towers, an effective and common means for industrial process heat extraction, are not a closed-loop system.

As a result, they are virtual vacuum cleaners for air- and water-borne particulates that can foul valuable downstream equipment such as spray nozzles, welding operations, chillers, heat exchangers and small bore piping in cooling circuits.

In fact, many plants must shut down cooling water systems several times per year to clean the cooling tower and downstream equipment, which is time-consuming and expensive.

Although some basic solutions to this problem are available—including rudimentary water strainers, side-stream filtration (which involves filtering a small percentage of the total water volume) and point-of-use (POU) filters for specific critical equipment—the relative insurance of full-stream filtration to protect all downstream equipment has emerged as the new standard for cooling tower water systems.

It's a Dirty Job

"A cooling tower will suck in a lot of air from the environment," said John Flaherty, president of Delta Cooling Towers, Inc., Rockaway, N.J. "Any foreign material or elements in the air can easily get sucked into the tower, and a portion of that will either get dissolved into or remain suspended in the water."

Water flowing through cooling towers can be contaminated from a number of sources, including ambient air, makeup water sources, corrosion and rusting of metal cooling tower "skin" and residue picked up from processes. Airborne contaminants include leaves, paper, debris and other pollution.

"A cooling tower works through evaporation, so you're continuously making up whatever cooling system water has been evaporated," said Flaherty. "Many plants use city water, which is comparatively clean. But if you are using lake, river or runoff water, you will have to address problems of suspended and dissolved matter that can damage downstream equipment or make it less efficient."

The introduction of more efficient technology for cooling tower water filtration dates back to the 1960s, when the multi-element, automatic, self-cleaning strainer was introduced by R.P. Adams.

A New Design Option

This design provides an alternative to sand filters, centrifugal separators and basket-type strainers. Unlike those designs, which have limitations in particle size filtration and also require frequent maintenance, the multi-element, self-cleaning strainer can provide continuous removal of suspended solids down to 25 microns.

While multi-element strainers may be used in a side-stream application, full-stream configuration is normally recommended because it provides complete filtration of water at all times.

Unlike side-stream filters which are sometimes used with cooling towers, the full-stream use of a multi-element strainer enables cooling systems to remain online continuously because it backwashes elements in sequence, one at a time. Therefore, all the remaining elements are available for continuous straining. With such full-flow straining capabilities, plant equipment is provided positive protection at all times—the optimum situation.

Conversely, due to limitations in straining area, other strainer designs and POU filters can become clogged quickly. When that occurs, cleaning, media replacement or backwashing is necessary, which adversely affects productivity as well as maintenance costs. If maintenance is not performed in a timely manner, spray nozzles, heat exchangers and other production equipment can become fouled, less effective or damaged.

Another significant feature of the multi-element design is in the design of the backwash mechanism. With automatic basket strainers, for example, the backwash mechanism comes in close or direct contact with the straining media. This can be problematic because large, suspended solids often encountered in raw water can become lodged between the straining media and the backwash arm. The result is damage or rupture of the straining media that can compromise downstream equipment.

The multi-element design instead utilizes a tube sheet that separates the straining media from the backwash mechanism. This prevents the backwash mechanism from coming into direct contact with media and eliminates the possibility of damage to the elements, resulting in reduced maintenance and downtime.

When considering strainer technology for a cooling tower's water system, continuous, full-stream filtration provides the most comprehensive protection for the cooling tower as well as all downstream equipment and piping. The automatic, self-cleaning, multi-element strainer is a reliable, cost-effective solution. WWD

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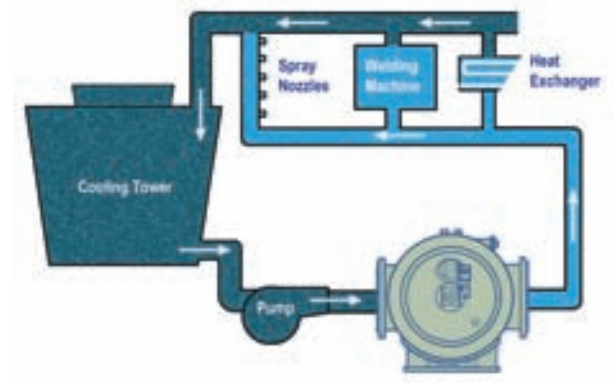

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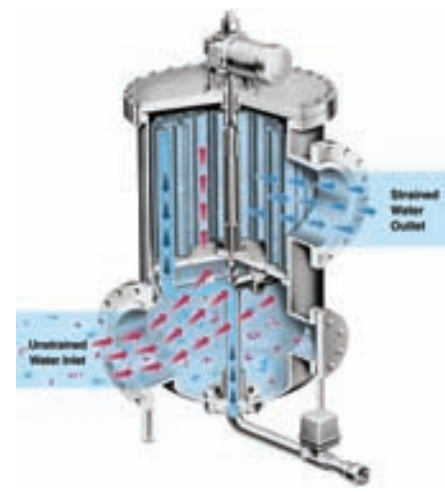

3 Multi-element self-cleaning strainers provide continuous full-stream protection with minimal backwashing or maintenance. Although multi-element strainers may be used in a side-stream application, full-stream configuration is normally recommended because it provides complete filtration at all times.

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