Cooling Tower Case Study

Georgia College & State University • Milledgeville, Georgia

"Automatic Disc Filter Keeps University's Cooling Water Clean"

An often overlooked aspect of cooling water systems is adequate filtration. An increasing number of cooling tower users are installing automatic filtration systems to remove particulate and control contamination levels. At Georgia College & State University in Milledgeville, Georgia, automatic, self-cleaning disc filters have provided an efficient and cost-effective solution to maintaining cleanliness and optimum performance of their cooling towers.

Georgia College & State University

Cooling towers, by their nature, are excellent air scrubbers. The cascading water washes airborne particles into the tower basin. These particles collect in the system and cause an array of problems with downstream equipment and the tower itself. Reduced cooling efficiency, shortened equipment life, increased maintenance and frequent downtime all can result from high concentrations of particulate. In addition, particles provide a "breeding ground" for algae and biological growth. Effective control of contaminants can enhance chemical water treatment and reduce costs by limiting "sites" for organic growth.

Kevin Murner, Associate Director of Operations and Maintenance, evaluated several filtration options for a new, three-cell cooling tower at the college. An automatic *Turbo-Disc Filter* system, manufactured by Miller Leaman, Inc., was chosen based on prior experience with a smaller *Turbo-Disc Filter* system. The smaller *Turbo-Disc Filter* system performed well and provided effective, automatic filtration with minimal maintenance and operating costs.

The 10-pod automatic *Turbo-Disc Filter* is installed on a side-stream loop and pulls dirty water from the tower basin at a rate of 1,000 GPM and returns the clean, filtered water back into the basin. Side-stream filtration results in the entire system volume being circulated through the filter multiple times per day. The system is comprised of multiple "pods" of disc filters, stainless steel manifolds and piping, a circulation pump for system flow, and controls for automatic operation.

Turbo-Disc System Installation on the GA College Cooling Tower

The filter pod utilizes a stack of polypropylene discs with grooves molded into each disc's surface. When stacked, the grooves overlap in a "cross hatching" effect, therefore creating a tortuous path through which the dirty water must flow. Particles are trapped by the discs and accumulate until the filter requires backwashing. Disc filtration technology was developed decades ago *(continued on page 2)*

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and was originally used to filter fine metal particles from hydraulic fluid on aircraft.

When the filter requires backflushing, the flow direction is reversed through each filter pod sequentially. A small amount of compressed air is used to evacuate the vessel and flush the dirty water from the pod. Clean, filtered water is then sprayed from multiple nozzles located in four spray bars, spinning and scouring the discs clean. Each pod takes just 20-30 seconds to backflush with as little as 8 to 10 gallons of water (per pod).

1,000 GPM Turbo-Disc Filter Side-Stream Skid System

The extremely low volume of water required for backflushing is a significant advantage over other types of filters, such as sand media filters, which are conventionally used in this application. Significant savings in water consumption and associated chemicals can be realized. In addition, a smaller installation footprint, easier maintenance and user-friendly controls made the *Turbo-Disc Filter* system a very cost-effective choice.

The original filter installed at the college was a single-pod air-assist automatic *Turbo-Disc Filter* rated at 70 GPM. The filter has been in service for several years.

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