TOWER-FLO®
Water Filter Systems

TECHNICAL BULLETIN

SERIES:	**ALL**
TOPIC:	**SIDESTREAM vs. SLIPSTREAM INSTALLATION**

*Occasionally, we are confronted with designs for **slipstream** style of filter installation versus the **sidestream** style Tower-Flo® generally recommends. First, let's be precise in our definitions. **Sidestream** filtration means a filter system which draws water from and returns it to a reservoir of water in the cooling loop, completely independent of the cooling water recirculation system. Usually, that reservoir of water is the basin of the cooling tower or sometimes it may be a chilled water storage reservoir in the cooling loop. **Slipstream** filtration means a filter which is installed on the recirculation piping system, "slipping" a portion of the recirculation flow through the filter system. Depending on the points of connection to the recirculation piping, the **slipstream** may be either under the influence of the discharge side or the suction side of the recirculation pump.*

*The motivation for a **slipstream** style of installation is usually either a desire to place the filter system indoors in the mechanical room, as opposed to outdoors by the cooling tower, or to avoid having the additional pump included in a sidestream filter system. All **Tower-Flo®** Water Filter Systems are suitable for outdoor installation (some winter ice protection may be required for site specific conditions) and a slipstream style of installation does not eliminate the need for some mechanism to cause flow to the filter (discussed below). **Slipstream installation typically makes the filter more expensive and nearly half as effective as a sidestream installation** and is, therefore, a disservice to the filter owner/end-user.*

*The basic theory behind **sidestream** installation is that the basin of the cooling tower (or a chilled water reservoir) is the area of lowest water velocity and lowest water turbulence in the recirculation system. Solids intrained in the water recirculation system will tend to settle out in the area of lowest velocity/lowest turbulence. Therefore, this area is the easiest and most effective place to influence the movement of suspended solids toward the filter for removal. Further, with a well-conceived sweeper piping system returning filtered water into the basin, it is possible to create the secondary benefit of a sweeping action across the basin floor which will move solids that have "settled out" toward filter suction for removal.*

*A **slipstream** style of installation presents several problems for effective filter performance at a reasonable cost:*

1) *in a **slipstream** style there must be some mechanism to cause flow to divert from the recirculation piping into the filter's slipstream. That mechanism is either:*
   a) *the filter system pump performing as a booster pump on the slipstream; or*
   b) *a throttling valve in the recirculation piping that forces flow through the filter; this is usually unacceptable due to the increased head it places on the recirculation pump.*
2) *even with the pump or a throttling valve, the filter will be less effective because the movement of solids to the filter is significantly reduced because solids intrained in the cooling water are not likely to slow down to 10% to 25% of their recirculation velocity and make a 90° turn into the connecting piping to the filter (which is likely to be less than half the diameter of the recirculation pipe) to be delivered to the filter for removal.*
3) *the filter vessel for a **slipstream** must be built to accommodate the operating pressure of the recirculation system while the vessel for a **sidestream** must only accomodate the pump which is matched to and supplied with the filter system.*

For more information on general filtration principles or to discuss a specific installation, contact your local Tower-Flo® Representative or contact the Tower-Flo® Water Filter Systems Division of United Industries, Inc.

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