

The hidden cost of inaccurate flow measurements

Smart testing can help utilities reduce the cost of environmental compliance

HOLDEN, MA, UNITED STATES, May 23, 2016 /EINPresswire.com/ -- Capital investment planning is not the only reason for power plants to have a clear understanding of their cooling water flows and pumping system performance. Today, environmental factors such as fish protection make it more important than ever to have current and accurate measurements.

What you don't know could cost you

That's because the recently rewritten Section 316(b) of the Federal Clean Water Act, which dictates how power plants and other industrial facilities must protect fish at cooling water intakes, bases much of its applicability and compliance requirements on intake flows. A plant's actual intake flow can determine which requirements apply and help to manage the cost of compliance.

One common misconception is that intake flows are always known. After all, plant cooling systems were designed for a specific flow, and the installed pumps were chosen accordingly. Yet in reality, most thermal power plants in operation were built more than 40 years ago. Degradation and fouling in the pump internals, condenser systems, and discharge system all happen over time. A facility's systems may have been modified, and environmental conditions change. Taken together, these changes can potentially drop actual flows as much as 25% below design.

The numbers to know

_ The 125 MGD threshold

Facilities with an actual intake flow (AIF) greater than 125 million gallons per day (MGD) will need to submit five additional studies— known as §122.21(r) Studies— along with peer reviews. Facilities with an AIF less than 125 MGD may not be required to complete these five studies— a potential savings of between \$500,000 and \$1,000,000 for each discharge permit renewal. If a facility's intake flow is close to this threshold, it is critical to get an accurate measurement.

_ The 0.5 FPS threshold

The U.S. Environmental Protection Agency (EPA) has determined that most fish can avoid impingement when the flow velocities passing through an intake screen are less than 0.5 feet per second (FPS). If the designed or actual through-screen velocity is close to this threshold, an accurate flow measurement could eliminate the requirement for a two-year optimization study and/or impingement monitoring—potentially saving as much as \$170,000 per year.

_ AIF less than or equal to 24% of DIF

One of the management practices available for complying with the Section §316(b) Impingement Mortality requirements is to demonstrate that the annual AIF is less than or equal to 24% of design intake flow. To exercise this option, a facility must have accurate measurements of both the AIF and

the DIF.

_ Reduction of fish impinged and entrained

All facilities with an AIF greater than 125 MGD must quantify the theoretical number of fish entrained at their intakes. Since the number of entrained fish is proportional to the volume of flow, accurately measuring the AIF provides more realistic estimates. If the AIF is lower, the facility may reap the benefit of reduced entrainment. Facilities may also show reduced impact through lower intake flows at certain times of year. Regulatory agencies generally accept that a percent reduction in flow yields the same percent reduction in harmed fish. Seasonally reducing flow can be a strong negotiating tool when working towards a mutually agreeable permitting solution.

Getting a handle on flow

The potential gap between design flows and actual flows is often “out of sight, out of mind.” But documenting your facility’s flow data is a task that can be performed relatively quickly with minor disruption to operations—and has a strong potential return on investment. Accurate measurement does not require a flow meter to be installed, and is most often performed in one of two ways: through dye dilution or through multi-point velocity measurements. Whichever method a facility chooses, working with an organization that is experienced in field flow measurement will ensure that investment provides the level of accuracy necessary to achieve the desired returns.

About [Alden](#)

Alden (Alden Research Laboratory, Inc.) is an internationally acclaimed leader in solving flow-related engineering and environmental problems. Since 1894, Alden has provided engineering, field and laboratory technical assessments to meet regulatory agency requirements. With laboratories in Massachusetts and Washington and offices the country, Alden provides compliance, environmental services, physical and computational flow modeling, flow meter calibration, and field services.

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