"Time-Sharing Sampling Shows Advantages"

An increasingly competitive business climate forces instrumentation supervisors to seek methods to reduce cost and improve performance. Time-sharing of water chemistry instrumentation affords the user significant cost savings and performance advantages and is commonly practiced by power, pharmaceutical, and semiconductor plants. The term time-sharing refers to the practice of using one single-channel analyzer among multiple sample streams on a time-share basis in lieu of dedicating one analyzer to one sample stream.

An American Society of Mechanical Engineers (ASME) specification for power plant sampling instrumentation recommends time-sharing samples because using one analyzer eliminates possible error between analyzers and provides a precise comparison of relative values between two or more streams. Time-sharing is commonly implemented when measuring silica, sodium, dissolved oxygen, hydrazine, phosphate, or total organic carbon (TOC).

For example, a single sodium analyzer, alternating between condensate polisher inlet and outlet, can resolve the onset of exhaustion with fractional parts-per-billion (ppb) precision. The onset may otherwise be masked by the normal range of variation with independent analyzers. There are other cases in which time-sharing is ideal to achieve the necessary precision between sample measurements in order to detect minute differences otherwise masked by normal instrument accuracy. For instance, dissolved oxygen measurements of low pressure heater drains, and of condensate pump discharge, are ideal for timesharing on one analyzer. Another example is the pairing of deaerator inlet and outlet samples.

Time-sharing sample permits visual inspection by identifying relative zero and exposing zero shift when both values migrate upscale by equivalent amounts. Relative zero can be reestablished without servicing the analyzer. For example, in a boiler drum system, time-sharing a condensate sodium analyzer with a saturated steam sample can be used to establish relative zero and reveal long-term instrument performance.

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Time-sharing boiler water, steam, and/or feedwater samples permits assessment of instrument performance by visual inspection. Colorimetric analyzers, such as for measuring silica, are subject to upscale zero drift because of cell fouling. Time-sharing such an analyzer is beneficial. For example, a silica analyzer can alternate between boiler water and feedwater. Meanwhile, a hydrazine analyzer can also alternate between these samples. The switching allows the silica analyzer to rinse down with feedwater to a relative zero, while the hydrazine rinses down with boiler water to a relative zero hydrazine value. The sample switching action will provide visual verification of instrument performance and of shifts in instrument zero settings.

Proper sample conditioning and flow control is important in obtaining accurate results when time sharing. Use of a special manifolded sample valve which eliminates cross-contamination is recommended.

These sampling benefits and the cost savings by needing fewer analyzers show the advantages of time-sharing analyzers.

Excerpt from: Riggs, Larry; Randy Woodard (Florida Power & Light) & Bruce Weiss (Sentry Equipment Corp.), "Time Sharing Water Chemistry Instrumentation", Ultrapure Water, Nov. 1995.

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