Optimizing Cleaning Maintenance by Jay Boyd

The decade's old prescription for cleaning maintenance1 is to aggressively and continuously clean the collection system. The sound logic of continuous cleaning keeps sanitary sewers free of capacity reducing obstructions including fats, oils and greases (FOG), roots, debris, and sediment, all of which can result in SSOs. Typically, conventional cleaning processes include a combination of both system-wide cleaning, usually over a period of one to five years depending on the size of the collection system, as well as "high-frequency" (weekly, monthly, quarterly) cleaning of "hot spot" segments. These are schedule-driven processes. This approach is shown to be effective for reducing SSOs2. Concurrently, it directly impacts capital demands for equipment as well as operating expense for hiring and training personnel, acquiring tools, maintaining equipment, and providing the necessary insurance, fuel, water, and much more for supporting ongoing operations.

Schedule-driven cleaning processes consume maintenance resources challenging them to meet the schedule's demands while addressing planned and unplanned maintenance tasks. Coupled with unanticipated staffing fluctuations i.e., retirement, sickness, personal time, organizational stress is heightened. With conventional, schedule-driven cleaning processes, maintenance crews typically don't know site conditions upon arrival. Often, these crews are cleaning already clean pipes. Effectively, schedule-driven cleaning promotes overcleaning and consequently wastes maintenance resources. Less obviously, overcleaning contributes to pre-mature pipe degradation leading to reduced asset life3. Finally, between scheduled cleanings, maintenance teams lack remote-site condition feedback. Hence, SSOs are an ongoing threat.

Unquestionably, utilities must meet regulatory requirements for lowering SSOs. In spite of the expense and organizational impact, cleaning is essential. Funding gaps to support these expenses are quite common. Often, political pressures to control rate increases mean that utilities must contain operating costs even with increasing demands of aging infrastructure. In sum, conventional, schedule-driven processes are a bitter pill to swallow to make ends meet. Needing relief, a growing cadre of utilities are embracing technology where real-time monitoring and advanced analytics drive the cleaning process. Using actual remote-segment conditions, the objective is to simultaneously lower cleaning frequency and mitigate SSO threats. Through new machine learning technology, subtle remote-site flow pattern changes are detected, communicated and predictively drive cleaning frequency. A number of utilities including San Diego, CA, La Mesa, CA, Renton, WA and more, have implemented these segment-driven, Optimized Cleaning processes. They have successfully demonstrated cleaning frequency reductions of 78% to 93%. Moreover, SSOs have been prevented at monitored sites. This new "tech cure" is optimizing the cleaning process with utilities realizing substantial productivity gains and corresponding lower stress on maintenance. This is being achieved with a rapid return on investment. Moreover, monitored segments are being protected 24/7 from SSOs.
This presentation presents data that quantifies changes in cleaning frequency and presents directly related financial impacts. Moreover, these results suggest how other utilities, large and small, have an opportunity to successfully meet regulatory requirements for SSO reduction and do this through a more cost effective, safer approach to maintenance.