

Utility: Metropolitan Sewer District of Greater Cincinnati

Topic Area 6 - Leverage Communications & Computing Platform: Optimizing Operations During Wet Weather

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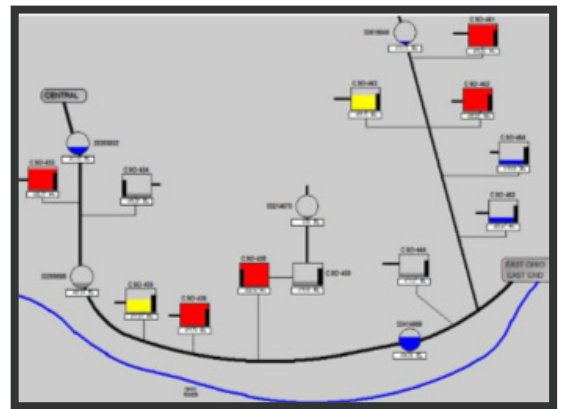
Dates: 2014-present (Case Study prepared in February 2017)

▶ BACKGROUND/DESCRIPTION OF CHALLENGE

The Metropolitan Sewer District of Greater Cincinnati (MSDGC) has one of the most challenging collection systems in the country to manage during wet weather as it contains more than 200 combined sewer overflow points. Together these overflows discharge over 11 billion gallons of sewage into the Ohio River and its tributaries during a typical year. The utility is under two consent decrees to reduce these overflows, with the cost of compliance exceeding \$3.2 billion dollars. With sewer rate increases over the last ten years bringing the typical household's bill close to the limits of affordability, MSDGC was driven to find new ways to address its wet weather challenges that were less costly.

▶ RESPONSE/SOLUTION IMPLEMENTED

In 2014 MSDGC began installing sensors throughout its largest watershed, adding secure cellular telemetry to its wet weather facilities, and tying the data together in a dedicated SCADA system for wet weather operations. By early 2016 MSDGC had gained both real-time visibility and control of its wastewater system in the watershed and transformed the wastewater collection system into a "smart sewers" network. To date, MSDGC's Smart Sewer System covers over 150 square miles (approximately half) of its service area, incorporating 2 major treatment plants, 6 wet weather storage and treatment facilities, 4 major interceptor sewers, 164 overflow points, and 32 rain gauges and river level sites. Early benefits



of the system have been achieved by maximizing storage, conveyance and treatment capacity of the wastewater system during wet weather. Remote monitoring has improved the maintenance of wet weather facilities and enabled upstream facilities to account for downstream interceptor conditions, increasing overflow capture basin-wide during wet weather. Several unanticipated benefits were uncovered as treatment plant operators, having views previously only inside the plant, began 'seeing' the collection system for the first time. Upstream flow levels are used to generate flow projections that plant operators can use to bring equipment online and to adjust gates to take higher strength wastewater during periods of river intrusion. Further, specialized alerts generated by the system enable a large industrial customer to adjust their discharge of high strength waste during specified wet weather conditions, and has streamlined overflow detection and reporting efforts across the system. Altogether, the dedicated wet weather SCADA has enabled MSDGC to reduce overflows from the collection system by an average of 400 million gallons per year, at a cost of \$0.01/gallon.

▶ OUTCOME/LESSONS LEARNED

The system enables MSD to optimize the use of existing infrastructure in real-time so that fewer and smaller facilities need to be built in the future, reducing the capital investments needed to comply with the next phase of the consent decrees by tens of millions of dollars. A real-time window into the collection system during wet weather has also exposed the underutilization of interceptor sewers since rainfall is often spatially varied. The upsizing of CSO underflow pipes and the addition of automated control gates that are integrated into the wet weather SCADA system are planned as future cost effective wet weather solutions.

References/Links:

http://msdgc.org/downloads/news/Sustain_Magazine_article_12-2016.pdf