

July 2023 Director Questions – Rachel

P. 65, Check #4567 to Smart Cover Systems - Can we have more detail in the function, capabilities and benefits of these covers?

SmartCover© Systems offers cost-effective satellite manhole monitoring solutions to eliminate sewer overflows, optimize collection system cleaning, minimize odorous H₂S gas, and accurately identify inflow and infiltration (I&I). Their comprehensive dashboard with alarms and notifications allows you to efficiently manage real-time data to enhance performance, reduce costs, and optimize resources.

Please see the attached brochure

P. 95 - Power failure at three pump stations. Please provide cause(s) and any future preventive measures.

Lauer - This was a power outage due to PG&E equipment failure. We have backup generators at all of our pump stations for when the power is out. Power outages will continue into the future due to fallen trees or PG&E aging equipment.

P. 131 - Source Control Six Sigma Project - Background on why this project is On Hold and when might it be resumed?

Unfortunately, we've had some staffing challenges. Our staffing levels can be a bit fragile and at times upset even the best intentions.

1. Ray DeOcampo took 3 weeks vacation to visit family in Ireland.
2. Fanny Mui left CAWD for employment closer to her family the end of February.
3. New employee Jacob Gams started in Lab on June 26th (a 4 month gap between Ms. Mui and Mr. Gams)
4. Trevor Holland asked for personal leave effective July 17th for 5 months. He may or may not come back. I spoke with his father who indicates it's a great opportunity for Trevor and part of his succession plan. Trevor's dad owns Monterey Bay Analytical labs. That means in 5 months we may be recruiting again.
5. Right now, we have Rommel Lopez, Operator I filling in at the Lab. This also means Rommel is learning on the job and it means that Operations is short one operator.

Sometimes everything revolves around available staffing. The project will be resumed when the Lab/Source Control is fully staffed.

SmartLevel™ Sewer Level Monitoring

SmartLevel™ is used for measuring and reporting sewer levels. SmartLevel provides collection systems with unmanned operations monitoring real time sewer levels 24/7/365. Any subtle nuances in level data are analyzed and when irregularities or anomalies are detected, the system sends notifications for situational assessment. Combined with the SmartTrend analysis tool, the system is able to indicate when and where there may be a potential pipe blockage due to debris, fats, roots, oil or grease causing levels to rise.



Our Subsonic® sensor measures from the bottom of the invert to the manhole cover using both ultrasonic and pressure readings, ensuring level is measured even if the sensor is submerged

Where it Works

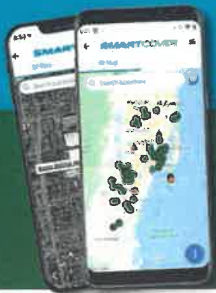
SmartLevel is highly versatile for use within different environments:

- Wastewater collection system
- Raw water conveyance system
- Stormwater system
- Any open water channel
- High frequency cleaning locations
- Siphons and easements
- Older high risk pipes
- Flooding
- Lift station back up
- Environmental or politically sensitive areas

Featuring

- Hardware components engineered to function in wet, humid, corrosive conditions
- Flexible patented sensor designs and deployment
- NO CONFINED SPACE ENTRY* installation or service
- Reduces traffic management resources
- Secure, online dashboard with easy-to-read, visual reports
- Compact, long lasting battery
- Two-way communications permits remote settings management
- Fusion with rain, river and tide data
- Done-for-you analytics
- Works when there is no power
- Satellite coverage works with sites difficult to access and withstands cellular outages
- Variable timing options for data scan and notifications
- Built in tilt switch for real time entry detection
- Encrypted secure servers with redundancy
- Mobile app for iOS and Android
- API available
- Configurations for open channels, canals, holding tanks, lift stations, outfalls, reservoirs, and utility vaults

*as defined by OSHA 29 CFR 1910.146b



With the SmartCover mobile app, get the insights you want, when and where you need them. Available for both iOS and Android devices.

SmartCoverSystems.com

INFRASTRUCTURE

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Posted on: August 25, 2017



SMART MANHOLES HELP NATION'S LARGEST CITIES CUT DOWN ON COSTS

How San Antonio and other municipal sewer utilities are using the Internet of Things to lower maintenance costs and overflows.

By Angus W. Stocking



Smart Cover Systems

The SmartCover is a remote field unit (RFU) consisting of ultrasonic water level sensor with 0.0625-inch resolution and recording level measurements every 12 minutes, satellite transceiver for two-way wireless communication, two-year battery, brackets for connecting these instruments to the cover, cloud storage for data storage and real-time analysis, and web-based viewing dashboard. Because the product detects upstream and downstream changes, one cover can monitor several adjacent segments depending on pipe segment slope and manhole configuration.

floats to monitor water level. They eventually brought a more sophisticated solution that combines sonar sensors, satellite communication, and software to market. With 160 million operating hours logged and 23,000 surcharge events detected over the last decade, the system has paid off for several large sewer utilities.

"We get three or four thank you notes and testimonials from directors every month," says Boyd. "That tells us we're making a difference."

Pilot Program Prompts Change

To prevent overflows caused by tree roots and debris, the San Antonio Water System (SAWS) had launched a high-frequency cleaning (HFC) program that hit some pipe segments once a month. The utility installed 10 covers in these high-risk sanitary sewer overflow locations as part of a [2009 pilot project](#).

"It was a huge workload," says Construction & Maintenance Director Alissa Lockett. "We wanted to see if automated monitoring could reduce the number of cleanings."

The "smart" cover solution consists of a sonar attached beneath the cover that detects water level changes to within one-tenth of a foot; radio transmitter and antenna on the cover top, which can be recessed if desired; and chip that automates

In 2005, it wasn't obvious that manhole covers needed to be improved or even that they *could* be improved. They're simple, durable, and cheap; fulfill their function perfectly; and neither the material—cast iron—nor the circular shape admit of any flaws.

Even so, David Drake and Gregory Quist sensed an opportunity. Quist had been on the board of directors for the Rincon del Diablo Municipal Water District in the City of Escondido, Calif., for 25 years and was director of the San Diego County Water Authority (SDCWA) board for 12 years. Drake had represented Escondido as a SDCWA board member for nine years.

"They went out and asked public works directors and sewer system operators, 'What keeps you up at night?'" says Jay Boyd, senior vice president of [SmartCover Systems Inc.](#) in Escondido. "The answer was inflow and infiltration. New regulations were being put in place, and overflows could cost cities as much as \$10 a gallon."

Realizing that an early-warning system was needed, Quist and Drake first considered using

"The savings more than offset the system's costs."

IN THE KNOW



THREE MYTHS ABOUT CONTRACTORS IN RESIDENTIAL SLABS
Not installing joints opens the potential litigation in addition



HOW LONG CAN A READY-MIX TRUCK WAIT?
We were all set to start when the lab's field tech stopped the po





Smart Cover Systems

The cover regularly scans each manhole, usually daily, searching for anomalous level or pattern changes associated with fats, oils, and grease (FOG) buildup, grit accumulation, roots, or pipe degradation. When it detects a change, the system e-mails or texts the customer that something that may require action is happening. On this map of the San Antonio Water System, green circles indicate normal status. An orange circle indicates a worrisome trend; a red triangle is an alarm.

Over 12 months, the utility performed seven cleanings based on the monitoring and trend analyses. Five were at one site. HFC scheduling would have called for 120 cleanings. Based on the pilot project's results, the utility has about 300 smart covers in operation and plans to install 200 more. The utility and the company estimate that 750 overflows have been averted.

"Without 24/7 monitoring, you have to schedule based on historical factors," says SmartCover Systems' Boyd. "But sewer systems are highly dynamic; they can clog up in an instant. Smart covers report surcharges within minutes, so maintenance departments can react quickly."

Saving the Sewers

In addition to reducing maintenance costs and overflows, making collection systems "smarter" also has long-term positive impacts on sewer system lifecycles.

"Cleaning is hard on sewers, given the high pressures of jetting," says Boyd. "National averages suggest that replacing sewers can cost \$1 million per mile, so even a 5% lifespan extension due to fewer cleanings represents big savings. We think it could be as much as 20%."

The product has evolved since 2005, based on customer feedback. Cellular connectivity has been replaced by Iridium satellite communication. "Cellular service often went out when it was most needed: during storms," says Boyd. "The Iridium service is available everywhere and doesn't fail. It was the only communication that kept working during Superstorm Sandy, for example."

Battery life is guaranteed for two years; some have lasted six years. The product's sensor package sends maintenance alerts when the battery needs to be exchanged.

Because there's no physical contact with sewage, the calibration-free sensor packages tend to last indefinitely, while improved sensing algorithms make them more accurate. A tilt sensor sends "intrusion alerts" when the cover's disturbed.

Firmware and software have improved as well. Alerts can be configured remotely from desktops, individual sensors combine data to locate blockages on a GIS-like interface, and the system accesses tidal and weather data from the [National Oceanic and Atmospheric Administration](#) and other public sources to predict trends and avoid false alerts.

It seems a little fancy for the humble iron disks that've been around for centuries, but the results are real. San Antonio has lowered cleaning demand by 90% and overflows 25% and 30% annually. Green Bay, Wis., spent \$30,000 to outfit five storm and sanitary [sewer manholes](#) and may install more. Clearly, adding a little intelligence to a sewer system is a smart move.

monitoring and alerting. The manhole must first be cleaned to establish a monitoring baseline, but installation took about 30 minutes per manhole and didn't require confined space entry.

Learning to use the system was straightforward. "The interface and reporting system are very intuitive, navigation is easy, and we were using everything we needed right away," Lockett says.

Return on investment was immediate.

"We were surprised by how much unnecessary cleaning we were doing," says Lockett. "What changed was the objectivity; because the system is automated, and only responds to actual surcharges, we're cleaning now only when there's a need."

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