

STANDARD DEVIATIONS: Deep Doo-Doo

Greetings,

Mistakes.

They happen.

On February 9, 2017, a huge infrastructure catastrophe occurred in King County, Washington.



Thirty million gallons of raw sewage () with hundreds of tons of “partially treated solids”, and 235 million gallons of untreated wastewater were released into Puget Sound.

A report from the *Seattle Times* noted, “For more than a half-hour, at least 15 million gallons of untreated wastewater — including raw sewage — swamped the plant, pouring down stairs, smashing doors, flooding tunnels and hallways, and drowning millions of dollars of equipment as employees fled,” leaving areas of the facility 12-feet deep in raw sewage.



{King County Wastewater Treatment Division}

The financial costs are still accumulating, after an estimated \$25 million. But, the environmental damage cannot be ignored either; the Sound is home to endangered orca whales and numerous salmon runs that depend on clean waters.

This was an unprecedented disaster, sort of. If it had been the first, that would be one thing. It wasn't. West Point has seen near-misses and millions of gallons of raw waste dumped into Puget Sound at least three other times, in 2000, '06, and '09.



Man, it must have been one helluva failure, right? Nope. The problem was faulty float valves; the same technology that you depend on in your toilet.



{A bent arm of the float switch.}

Let the record show (because it does) that the problem had been known since 2000.

Rather than replace a part that runs a couple hundred bucks, a bent rod had been straightened by hand and put back into service in 2000.

In 2004, routine mechanical testing of the floats was dropped and *only electrical systems were checked* for emergency plans (because the float arms were still bent!?).

In '06, the electrical switches failed because they were left in bypass mode; 59 million gallons of untreated waste spilled into the Sound.

Corrective action included additional training for operators and changes to the operating manual.

In '09, the plant lost another 9 million gallons and closed beaches for days due to emergency gate malfunctions. The floats were never fixed.

After this last episode, a mile of tunnel, 151 electrical motors, two miles of insulation, 125 electrical panels, and 25 electrical transformers had to be restored. Operators reported that additional training in emergency responses was lacking.

It could have been worse. No one died.

The county, the state, and the plant have investigated this last incident. And what did they find? Well, sure, the floats sucked; they've been replaced with a different type of sensor. But all the reports find that training and communication played roles in the crisis.

Hmmm. Turns out that proper maintenance, communication, and training are pretty important.





{Almost like deconning the Sysmex?}

Preventive maintenance, communication, and training. Seems to ring a bell

Our instrumentation is vital to successful laboratory science. PM and routine service are essential components of good stewardship. And along with routine maintenance comes good disinfection and decontamination in our proper care of instruments. Too often the consequence of ignoring problems, work-arounds, and contamination come back to bite us where the ol' solid waste originates.

Communication is something we struggle with every day. The importance of awareness, transparency, unified understandings, and just plain documentation underlies the foundation of our dependability to good health care. Standard Operating Procedures (SOP) are the basis of communicating behavior and safety strategy. Following SOP is critical, but so is questioning. The dynamic of bi-directional communication influences the efficiency of our work. Lapses in communication only lead to trouble. Good communication leads to improvement.

Training is one of those nagging ingredients of effective operations. We use and depend on good training to ensure that staff understand what they do and do it safely. Of course, initial trainings are essential; we have to learn in order to work. But continual training is also fundamental to overall efficiency and *consistent* success. Making training stick is hard, and a lot of it falls back on our communication skills.

This newsletter edition could have taken a different path. I could have been more direct in the example, but we hear those stories so often that they start to lose their impact.



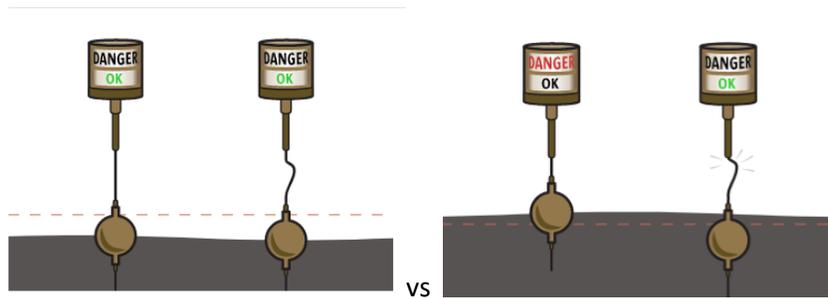
We know the tales of wrong-site amputations. We've seen mislabeled tubes. We've diluted IV solutions to find that meds were dosed wrong. Crossmatch mistakes, contra-indicated prescriptions, dilution errors, pipetting mishaps, and a plethora of human slip-ups have all happened in hospitals and labs. Instrument failures are devastating accidents that happen for no good reason and bad maintenance reasons.

Hey, at least we're not alone? Mistakes happen in just about every workplace where people depend on technology that works, where communication is essential to safety, and where training provides critical knowledge.

The questions I ask when thinking about biosafety are whether the tools are working, whether our SOPs are informing us about risk, and whether we are trained to work safely. Performing PM and routine service keeps our analyzers online. Reviewing and updating SOPs communicates our expectations of behavior and awareness of risk. Trainings prepare us for routine operation and response to emergency. Without them, we're just flushing good intentions down the toilet.

Have a great week and be safe,

Bryan



{Float function and plant site.}

