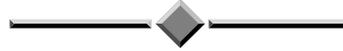


THE CENTURY OF THE SYSTEM – OR – LEARN TO LOVE YOUR CHECKLIST



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ABSTRACT

Sustainable Solutions operates and maintains treatment plants across north and west Australia. We have a love hate relationship with checklists that we want to share with you today.

Our experience is you have to wrangle the checklist into shape to make it work for you.

1.0 Why Systems Fail

We sent a very experienced operator to do some general water monitoring work with a mining company somewhere north and west of here.

On arriving at a bore that needed checking just after rain, our operator was about to jump out of the ute when the mining company engineer said “Hold On. It’s been raining, we had better Take Five” and pulled a five point checklist from his pocket and began ticking off the steps for safe exiting vehicles after rain.

Our operator was more than a little miffed to be advised by a fresh, young university graduate on how to get out of a car and he used some choice language to suggest where the engineer could store his bundle of Take Five cards.

Counselling our crusty old-mate failed to garner the required degree of remorse, and we had to find another operator for that site to keep the mining company happy. We eventually lost the job to a large engineering firm with more young graduates than crusty, bush hardened operators.

We all know the problem. The procedures are so full of detail, it is easier just to do what common sense dictates and tick the box at the end of the page. There is another way to approach the story though.

2.0 A Great Systems Tale

A hospital in a small mountain town in Austria has become world famous for taking people found frozen in the snow, thawing them out and over a two week period, gradually bringing them back to life. This “miracle” is now regularly repeated for international visitors who have come to check how they do it.

Dr Atul Gawande tells the story of a three year old girl who was brought back to life after an hour and a half without breathing and a blood temperature of less than 20 degrees Celsius. His talk takes about ten minutes and there is never a dry eye in the house, but we are going to skip over the schmaltzy bit and just describe what they do.

They start by thawing out the body, then kick starting the heart, then the lungs, and gradually bringing all the organs on line one after the other.

Two days after drowning, the brain is the last organ to be brought back, sometimes taking a week to wake up after being dead for two days. In the story of the three year old girl she had to go through similar rehabilitation as a stroke victim, but two years after drowning and being brain dead for two days, she had completely recovered.

The key to making this miracle happen? A huge amount of medical equipment based on an enormous amount of research. And all of that expertise has to be coordinated and applied at precisely the right point. And the key to that coordination? The humble check list. The whole system relies on a large team of medical specialists who all play a critical part in one of the steps to bringing the person back to life. The checklist simplifies an incredibly complex process.

Even more interesting is the way they made it work. That was by putting it in the hands of the telephone operator who takes the original call and putting them in charge of the whole project. The receptionist then takes ownership of the check list, calling heart surgeons, the anaesthetist and other specialists to warn them when they may be required and to keep them all up to date with the progress of a project that will eventually involve them in contributing their little piece to the miracle of reviving another “snow white”.

Gawande has put together a global agency called Lifebox, bringing the power of the checklist to third world countries to help improve the effectiveness of health care delivery. The check list, then, is sometimes the key to the miracle of modern system-theory and at other times the checklist can be an annoying pain in the rear end that we do our level-best to ignore.

The purpose of this presentation is to show you some of the tricks that we have learned to make it work for you, rather than enslaving and disempowering you.

3.0 Target Your Audience

Here are three different approaches we take to dealing with the same process – taking a dissolved oxygen reading.

One is designed for an engineer, one for an operator and one for the clients of a remote rehabilitation centre who have to run the sewage treatment plant while they are getting off the grog.

Put the wrong version of this procedure in the wrong hands and you are going to get unpredictable (but predictably unreliable) results.

4.0 Make It Real

Regardless of the intended audience, the key to getting buy-in for using a system is to making it useful and meaningful to the person who has to use it.

Here is an example of a checklist, put together by a US military contractor to test whether a sewage treatment plant is ready for commissioning. It took an engineer six days to read the checklist and convert it into a procedure for testing. The testing itself took three weeks.

A good checklist makes you think and develop useful approaches to problems. A bad checklist numbs the brain.

5.0 Back It Up

We deal with lots of situations that are completely unfamiliar to us. We have to trouble shoot them by taking things apart and putting them back together. It is very easy to lose track of something and find yourself at the end of the day with a couple of interesting looking components that are clearly important but you have no idea where they belong.

We pinched a method from the sparkies in the air force and use the simple precaution of having a set of numbered tags that we attach to every item that we touch. As we put things back the way they were, we remove the tags and put them back in our tag box. At the end of the day, if there are any tags un-returned, we know immediately that we have missed dealing with one of the items that we have fiddled with.

6.0 Keep It Simple

If you can't explain it to a twelve year old, you probably don't understand it yourself.

The Take Five approach used by certain mining companies, uses simplicity, a catchy title and a robust format to make the five step check list accessible, and regular reinforcement to make it stick. What the checklist does is simplify the complex into a series of steps. If you are first aid trained you know that the checklist is continually being simplified.

The reason for this is that if a checklist itself is complex, it does not perform its central role.

This is not dumbing it down, this is breaking it into its various components.

Remember: the computer in your smart phone can only count to one, can only add and subtract and save a number at a memory address.

7.0 Projects

Here are some of the projects where we have applied these principles. You will notice that despite the difference between the problems confronted at each site, some of these core elements keep appearing over and over again.

7.1 A Remote Rehabilitation Centre

This plant was originally built for an organization that went broke before it was finished. It was taken over by another organisation who was not well versed in commissioning treatment plants, or training untrained people to operate a plant.

We built a series of simple procedures to help staff deal with emergency situations and daily or weekly maintenance.

Here are some examples of those procedures and, yes, checklists.

Maintenance of Low-tech, Unloved Plants

We regularly come across clients who are strapped for cash, are doing the minimum they must to stay one step ahead of the regulator and who have switched off many components of their plant to reduce operating costs.

For obvious reasons we are not naming names, today.

As an operator, our responsibility is partly to the plant owner paying our wages and partly to the people who the plant is supposed to be keeping safe. We will argue about the ethics of that little dilemma over a beer or two this evening but the reality is that we have to do the best we can with what we are given.

Good procedures can help us punch above our weight. They can even create enough blue sky to make a pair of sailor's underpants and improve things as we go. In every case, the challenge is to get out of the reactive mode and into the proactive mode where we can perform preventive maintenance.

Here is an example of a maintenance schedule that was so far off track the client was pumping sludge every week.

In every case, good regular maintenance, brought the plant back in line, just by exploring the known problems a little bit further on every visit. Eventually we found that a broken grease trap was causing a list of problems downstream and misdiagnosis had led to an ongoing string of failures.

Metropolitan Stormwater Treatment

While it is fun to build new shiny systems with lots of automation and a variety of treatment techniques to polish the water, there are inevitable complexities that need to be dealt with.

It was on this plant that we developed the tagging system that provides a natural check for us to remember everything we have touched.

Like all great systems it is incredibly system and extremely powerful. Most importantly, it makes a difference.

7.0 In Conclusion

We are all safer and healthier as a result of the regulations and checks and balances that are put in place. I am old enough to remember driving around without seat belts, with a carton of beer at one hundred miles an hour. I was not driving, I was a child. Lying on the back seat, or on a bed made up on the floor well between the back and front seats of the family Plymouth.

Today that would be considered unsafe.

This additional health and safety comes at the cost of an increasingly complex society. Nearly all jobs required training and that training requires certification.

Managing that complexity well is a challenge for every one responsible for any system, whether it is a sewage treatment plant or a submarine.

The checklist is only one of a number of tools for simplifying that complexity but it is a particularly powerful one. If there is a take home message today it is to that you can only love your checklist if it helps you keep it real.