Co-innovating tomorrow™

YOKOGAWA

OpreX™ Managed Service

Managing the unexpected

Bulletin 43D07N10-01EN

Run to fail

How do you manage the unexpected?

An overwhelming amount of research has been done to understand the cost of unplanned shutdowns, process upsets, and the consequences of downtime and off-spec products. Usually, they conclude that anywhere between 3 and 7% of annual production is at risk.

The shocking thing is that most of the data is already available in your operations, but for one reason or the other making the combination between process data and other measures does not allow you to conclude in time that something is about to go wrong.

Most of us know this is reality, but we seem to fail to make it a priority. Why would that be?

Are we not all longing for "The Boring Plant," the plant where things are planned for and managed?

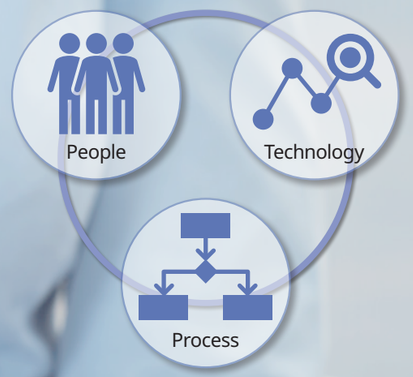
We also know that often we repair well ahead of the real need for repair, or we repair it because it is broken. We would argue that run to failure is not the best strategy even though some years ago, it was for some enterprises the going practice.

*The impact of unplanned downtime in the process industries has been vastly underestimated. ARC estimates that unplanned downtime is costing the process industries at about **$1 trillion per year in lost production and revenues.***

ARC Advisory Group, "Process Industry Downtime and Key Performance Metrics", 2017

While human error remains a primary reason for unplanned downtime, problems in the process or problems with the equipment controlling the process are more likely to blame. If that information is not effectively communicated to the operator in a timely and contextual fashion, your chances of an incident will go up significantly.

ARC Advisory Group, "Process Industry Downtime and Key Performance Metrics", 2017



“The Boring Plant,” is that for real?

Before we conclude if “The Boring Plant” exists, we should first agree on the definition.

Considering human health and protection of your capital, we believe that “The Boring Plant” is an operation where things run smoothly. Where production targets are planned for, feedstock has stable quality, operators are experienced, and the maintenance team is aware of all the risks in the plant. In addition, information is available to inform the operational staff about expected process upsets ahead of time. Just nice and boring.

The only challenge you have is to push the installation just to its limits in terms of product quality, product throughput, and total energy consumption, all to get the best return of the capital deployed. Does that sound boring enough?

> ***A well-managed factory is boring. Nothing exciting happens in it because the crises have been anticipated and have been converted into routine.***
>
> **Peter F. Drucker**

Now that we have defined in some general terms what a boring operation looks like, let us see how we can take you on a little tour to make this become something you can envision to be true.

How to create “The Boring Plant”?

A boring plant starts with using the data and information which is available today. There are many sources of data and information unused in a plant for preventing an event. Only when an incident occurs, this data will be consulted.

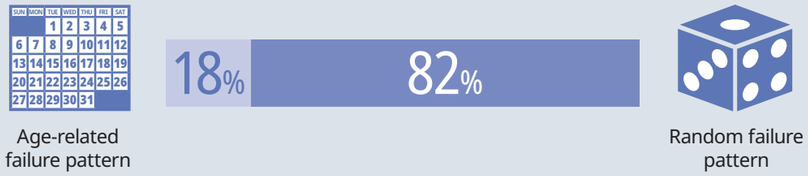
Conclusion: Technology is not the problem.

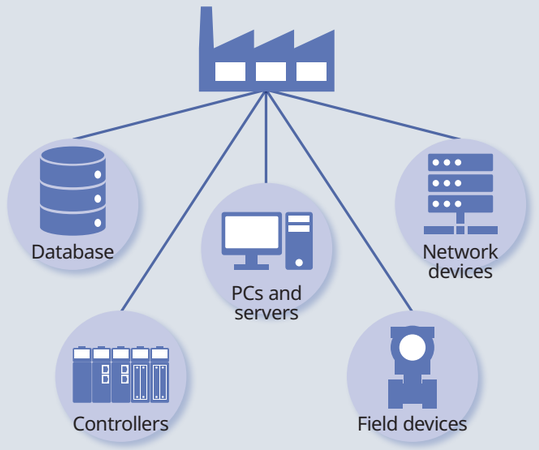
However, if Technology is not the problem, why are we still not using the data available? What we have seen is that the data is everywhere; in different systems, networks, applications, and formats. Bringing all this data together in one interface allows you to make links between data sets and start building the relevant dashboard that will help you make timely decisions.

But if it were all that easy, there would be thousands of boring plants already. Getting the Technology to work for you is an excellent first step, but underlying there is a Process and People element to it as well that must be addressed.

Preventive maintenance assumes the probability of equipment failure increases with use, and schedules maintenance based on calendar time, run time, or cycle count. However, data on failure patterns from four different studies show that (on average) only 18 percent of assets have an age-related failure pattern; 82 percent exhibit a random pattern. These data show that preventive maintenance provides a benefit for just 18 percent of assets.

ARC Advisory Group, “Improve Asset Uptime with Industrial IoT and Analytics”, 2015





We often see that all the maintenance related data is lockup in the devices (network devices, field devices, controllers, PC and servers), applications, and systems. Even on a small plant it is about 20 databases and more than 1000 devices, with hundreds of parameters each. This makes it an impossible task to check.

How are the Process and the People area integrated? The final step is providing work instructions and supporting information from a knowledge base. With the knowledge base, the loop is closed between People and Technology.

Digitalization may start with Technology like robots, artificial intelligence (AI), or IIoT. However, ignoring or not fully integrating the Processes and People aspects make most “Boring Plant” projects fail.

Go full circle or else your plant will not be as boring as you expected

Manageable and acceptable risk

We all balance our efforts around risk. And we are all very risk-aware and will go the extra mile to minimize risk for both our people, the environment, and our installations.

What then remains interesting is that while we are aware of data pockets available to help us understand, for example, compressor performance, we keep on focusing on the regular repair interval. But let us go back to the four major drivers for action: personal safety, process safety, environmental impact, and cybersecurity. Here we will focus on addressing process safety and cybersecurity.

To increase process safety, you can bundle as much data into one engine that provides you with dashboard capabilities to conclude over plant performance and possible events upcoming. The challenge is that when combining systems, you introduce a cybersecurity risk that could have significant consequences if not dealt with adequately.

But still things go wrong

Too often, data is gathered after the event to analyze what went wrong, which is unfortunate as most upsets could be avoided by learning from your installation data. But when this is so obvious, why do things still go wrong?

We have identified three main reasons why things fail

Integration of Technology, Process, and People

Companies decide on purchasing the Technology but fail to go full circle on adopting the Process and work instructions and to connect them to the people that need to use them.

A boring plant is where Technology, Process, and People are in harmony.

The cultural shift to proactive maintenance

Along with the technological advancement, Process and People also need to be innovated. Organizations must make a cultural shift from reactive maintenance to proactive maintenance.

The convergence of OT and IT

Cybersecurity and process safety sometimes request a specialist who can respond immediately when a risk is detected, which is at most of the operations not available. While the IT security team often manages OT security, realize that IT security and OT security are different distinct domains with a different skill set requirement. Therefore, it is of crucial importance that the IT and OT team have a solid plan that connects the needs of both to avoid gaps in the protection of your assets.

Stay within your own set rules for compliance

If Technology continuously stays disconnected from the People and Processes, there will be no closed loop. Connected here does not mean more paperwork; it is about true integration. Take care that Technology can check all human work. This way, we can check if all work is done following your expectation.

The **fully integrated dashboard** should help you to identify which processes are not compliant (Process), and it should, at the same time, show actions to be performed (People). Ultimately you want to eliminate 100% of the risk, but in fairness, this is always where the balancing act comes in.

For risk control and insights about where are the major risks, we deploy the **proven bow-tie analysis**. In most cases, this is currently a static model to do the risk analyses upfront. Filling the data with dynamic data, you will have a tool to predict, and you know your risks, including the level. And as such, you are in control through your leading indicators.

If you feel you lack adequate & skilled resources to carry out proactive maintenance and OT security measures, we are here to support your organization with our **Managed Services**. Our experienced SMEs (Subject Matter Experts) will provide comprehensive monitoring and maintenance services, on-site and remotely.

Where do we go from here ?

What if you could:

- **Gain more insights into your cost reduction opportunities?**
- **Identify means of how your plant becomes more predictable than before?**
- **Know how you can adapt to changes in your environment of operations regulatory compliances?**
- **Secure the safety and health of your employees?**

Wherever your motivation comes from, either way,
it starts with a good in-depth conversation, we would refer to as a workshop.

To learn more about how we can address your needs, contact your local Yokogawa service office or sales representative,
or visit **https://www.yokogawa.com/managed-service/**

Are you ready to co-innovate for a "Boring Plant"?

https://www.yokogawa.com/managed-service/

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