PWW
Plant Wellness Way

Plant Wellness Way Explained

Written for top-level managers, this document explains in business and financial terms how and why the Plant Wellness Way methodology gives industrial operations the edge.

Welcome

Hello, and welcome to Plant Wellness Way Explained.

In this document you will gain a broad understanding of how the Plant Wellness Way methodology works, and how the value it brings to your company can be quantified before investing into the process.

I first began my journey into researching asset health and reliability improvement after years of seeing consistently under performing industrial operations. Unexpected failures and ongoing high maintenance costs were, and still widely are, considered ‘normal’. However, I, like you, were dissatisfied with this and began to look for a better way.

Eventually, I realised that there was no system that truly removed risks and failure from operations - yet. So, I took it upon myself to develop a methodology that would create ‘the ideal system’. One with no breakdowns. That produced quality products first time, every time. Most importantly, the ‘ideal system’ would provide access to previously lost and wasted operating profits.

I called it, The Plant Wellness Way methodology.

The Plant Wellness Way (PWW) methodology is the culmination of principle from materials science, business finance, risk management, and psychology. While developing this methodology, I discovered what others in this field had previously missed - that reliability is completely controllable and, when controlled, it can give your company access to new operating fortunes.

As a result, I built PWW to be a system that shows you and your top-level managers the full financial impact of the risks (any opportunity that exists in your system that causes asset failure) that your business currently holds, and the financial costs of each option available to remove them. Financial indicators and data analysis are included throughout the process to help you to make the smartest business decisions for your company. I encourage you to read through this document with an open mind.

PWW is a system that works on a different premise to that of other EAM and maintenance system ‘solutions’. One where you have control over your business processes, and to achieve optimal outcomes you must lead your staff, bringing them with you and your upper managers on this journey.

My aim for this document is to provide those from a non-engineering background with the information needed to understand how PWW works and the opportunities it brings to your industrial operations.

Kind Regards,
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What is Plant Wellness Way?

The Plant Wellness Way (PWW) methodology is the only process available to engineer an Enterprise Asset Management system that removes risks and causes of failure from your company. By focusing on removing and mitigating the opportunities for risks to form, a PWW system achieves lasting improvements to operational performance, plant availability, and business cost reduction.

PWW is adaptable and scalable. It can be applied to key assets to improve their availability or, follow the process for your whole company and develop a refined Enterprise Asset Management system that meets ISO55001 standards.

PWW is applicable to all businesses, operations, factories, and plants that rely on physical assets and machines to produce, manufacture, or mine the products they supply to their customers.

Any site that is experiencing unplanned or longer than expected downtimes will benefits from the PWW approach. From regularly reoccurring minor breakdowns to large scale, low frequency, but high impact equipment failures - the Plant Wellness Way methodology gives you and your team the skills and knowledge to directly fix these issues at their root.

The processes, operational analysis tools, and philosophy of PWW are based in material science understandings of the true root causes of failure. Using the Stress-to-Process model, explained later, you develop a full business system that puts elimination of equipment part failure at the center. From suppliers to maintenance strategies, work place processes to asset health, PWW gives you the information and tools you need to make the smart business decisions that lead to operational excellence.

When fully adopted into your company, your staff become the finders of improvement opportunities. They are trained to use the information the system provides to recognise risks and apply their operational knowledge to achieve ongoing improvement outcomes. Your whole workplace will transform into one that seeks out answers, rather than continuing to list problems.

Plant Wellness Way seeks to provide you with the true answers to how to fix poor equipment reliability while also rewarding your company with improved operating costs.

You can read the fully detailed Plant Wellness Way methodology in the Industrial Manufacturing Wellness book.

What is Plant Wellness Way?

The Stress to Process Model is unique to Plant Wellness Way. The model gets you to engineer business processes that are precisely targeted to produce operating environments that remove the causes of plant and equipment part failure.

This means that your machines and physical assets are always operating within their most reliable operating zones. The overall process is summarised in Figure 1.

Each stage is supported by the necessary documents and data to make the best business decisions to efficiently achieve outstanding reliability.

From developing your workforces capabilities to ensuring that every new capital project generates the most profit possible – the Stress to Process model removes risks and builds reliability.

Praise for the Plant Wellness Way methodology and Industrial Maintenance Wellness book

"I have been focusing on RCM while at Toyota Motor Manufacturing NA. When I found Industrial Maintenance Wellness it bridged the gap between operational failures and component molecular failures. Mike's process are excellent and the documents he has develop shows deep understanding of how components fail and how to prevent performance loss..."

- Amazon Books Review,
United States, February, 2020

How Zero-Failure is Achieved

The underpinning logic of the Plant Wellness Way is that operational productivity is impacted by asset component failures. The more critical the component, the more critical the failure. As failures impact a whole company, so does PWW – delivering a holistic business system that supports lasting improvements in your company.

PWW acts to remove the causes of asset component failures by keeping the operating conditions within the environmental and operational boundaries that guarantees components achieve their full life cycle – removing the causes of unexpected failures and unplanned production downtime.

You can achieve this in your operations by applying the IONICS process and accompanying analytical tools to your system. The full tools and a technical explanation of the process and is available on our website.

IONICS - Six Steps to Success

The best way to demonstrate the effectiveness of PWW is through a worked, real world example of a simple ball bearing in a centrifugal pump-set. This example includes a fully financial analysis of how this small ball bearing can cause major problems for this company.

All the identifying aspects of the company in this example have been removed as per our privacy agreement.

In this example, the centrifugal pump-set was required to have near-perfect operational uptime to ensure the operation was able to run safely. After experiencing significant issues with a specific centrifugal pump-set the toplevel management, with the advice of their Maintenance Manager for this operation, made the decision to approach the problem from a new angle and engage a Plant Wellness Way consultant to review their maintenance strategy.

Following the IONICS process for this asset, the company engaged employees from multiple levels of the company to develop a detailed process map of the asset, its assets and operational influence.

When complete, the PWW Consultant guided the team through a Physics of Failure Reliability Strategy Analysis for each component. This analysis produced a list of the risks (causes of failure) present, followed by identifying possible controls that would either remove or reduce the opportunity for each risk to occur.

New controls were chosen based on this analysis, which were then reviewed to ensure they would produce optimal reliability. The chosen and proven controls were used to develop a new maintenance strategy for the pump.

This new strategy for the ball bearing, shown in Table 1, focused on creating an environment and operational processes that delivers high reliability of this component. As a result, these activities have been proven to produce a long failure-free life for the ball bearing and reducing the risk opportunity and severity if a bearing failure event was to occur.

Numerate Options your options for risk removal and mitigation that are available to you, using reliability analysis tools to identify the optimal operating conditions for the risk-prone parts. You and your top-level managers make the decision on what controls will be used to ensure these operating conditions are met. To help this decision-making process, the controls selected are checked to prove that they and their associated strategies will be successful before being implemented.

These decisions directly influence the outcomes that your operation will produce.

Next you **Introduce Solutions** into your existing maintenance, operating, and business procedures. The new controls and conditions are now part of your company and make up the new standards that your employees and suppliers are held to. Part of PWW is to make the most of the existing resources in your company, including your employees, so any identified training should be planned for at this point too.

If you do not already have a database that is accessible to everyone in your company, this is also developed so the new standards, specifications and procedures are universally available.

To maximise the benefits of the changes made you **Control Processes**. You look at how the new processes are written and being applied, seeking out ways to improve and clarify how to most successfully run the process. Key Performance Indicators for each process and Intermediate Performance ndicators for each process step are identified and written into the documentation.

Finally, you actively apply continuous improvement to your business, and **Synthesize New Ideas** from the KPIs and IPIs your system produces. You and your employees monitor the performance of each process and identify opportunities for further improvement.

Only through continuous improvement can you achieve a zero-failure operation.

Industry Example

IONICS guides you through a scientifically based, mathematically proven process to systematically remove risks from your operations and ensures they will not return. It can be applied to your whole operation or to a key asset that has a history of poor reliability.

1. Identify Risks
2. Order By Importance
3. Numerate Options
4. Introduce Solutions
5. Control Processes
6. Synthesize New Ideas

To begin with, you **Identify Risks** that exist in your company. Process maps and smart questioning of how systems work is used to identify where risks lay in your company and how frequently they occur. For each risk you determine the financial impact they can have on your business, including opportunity costs, costs to repair the failure, and hidden business wide costs.

Order by Importance every risk identified to make sure that whichever risks are removed will provide the greatest return on investment.

Equip Tag No.	Current Failure Events	Failure Events Freq	TDAF Cost of Failure	Risk Reduction Activity	Improvement Expected	Freq of Activity	Cost / Year	Failure Event Reduction
Pump 1	Bearings fail	2 years	$35,000	Laser shaft allignment to precision practices every time the pump is installed	A precision alignment is expected to deliver 5 years between bearing failures	Every strip down	$200	Failure interval is now likely to be greater than 5 years
				Oil and wear particle analysis every 1,000 hours of operation	Oil and Wear Particle Analysis can indicate the start of failure several hundred hours prior the event	1,000 hrs or Six monthly	$600	Failure will be prevented by a predictive planned condition monitoring task
				Visual inspection by the Operator each shift of the oil level in the sight glass	Visual inspection of the oil level ensure the bearings are always lubricated	Every Day shift	No cost	Failure will be prevented by operator condition monitoring
				Operator physically touches pump bearing housing each week to feel for changed temperature and vibration	Touching the bearing housing will identify impending problems before they cause failure	Wednesday Day shift	No cost	Failure will be prevented by operator condition monitoring
				Motor load monitoring using process control system to count overloads	Monitoring the electrical load will identify how badly and how often the equipment is stressed by overload	Continuous with monthly report to Ops Manager	$100.00	Poor operating practices will be identified and personnel trained in correct methods
				Pump performance monitoring of discharge flow and pressure using process control system	Monitoring the pump performance will indicate gradual changes of pump internal clearances affecting service duty	Continuous with monthly report to Ops Manager	$100.00	No direct impact on reducing risk of pump failure, but identifies performance drop and allows planned maintenance to rectify internal wear.
Total Cost of Failure Risk per Year			$17,500	Total Cost of Preventative Measure per Year			$1,000	

Table1: Operational Risk Reduction Strategy for Pump Bearings

With the Plant Wellness Way methodology, you and the decision makers can make informed choices about which risk removal and reduction actions are taken. Each decision that is made in the PWW process is checked to make sure it will provide the greatest return on investment to you and your business across the full life cycle of your plants and equipment.

You don't need to restructure your entire company or maintenance department to achieve these results. You can choose to apply PWW to select high-risk assets and develop maintenance processes and strategies for them specifically.

Contact us directly to remove the risk and bring about zero failure operations with PWW.

Testimonial for Training Course Content

"...I have enjoyed the course immensely as it has broadened my area of knowledge and given me the confidence to press ahead with my plan for changes at work."

- United Kingdom

Training and Consulting Services

To best help you and your business achieve optimal results with the Plant Wellness Way approach, we offer a range of training and consulting services.

We offer two main training courses on PWW:
The PWW Site Team Member Training Course (previously our Three Day Training Course) provides an overview of the key tools and concepts of PWW, and
The PWW Certified Practitioner Training Course (previously our Five Day Course) is a full immersion into PWW, covering the full process, tools, and concepts that combine together into PWW.

Read more at www.plant-wellness-way.com/learn/pww-eam-training-courses/

Contact us for information on our consulting service offerings.

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Find your local licensed Plant Wellness Way consultant at www.plant-wellness-way.com