THE ROAD TO RELIABILITY™

A Simple 4-Step Approach to Reduce Your Downtime by 90%

INTRODUCTION

Thank you for downloading the **Road to Reliability™ Roadmap**.

In this guide I will give you a high level overview of the four practices you need to master to reduce your equipment downtime by up to 90%.

And when you do so, you will also reduce your maintenance costs and improve your safety record.

The framework I will introduce is founded in some of our industry's best research and will work even in the most reactive environments. It's not something I've invented out of nowhere. I have summarized the research of some of the industry's most renowned experts and condensed it into a simple, practical model that everyone can understand. A framework that everyone can implement. A framework that works.

I call it the **Road to Reliability™**.

I hope you enjoy reading this guide and wish you all the best on your own journey down the Road to Reliability™.

Erik Hupjé
www.roadtoreliability.com

THE ROAD TO RELIABILITY™

There are many frameworks in use for achieving reliability. But I believe that most of the frameworks used in industry are unnecessarily complicated. We've all seen the temples or pyramids with 10 or 20 acronyms short for one or the other complex process that we must master to achieve reliability.

But must we really? In my experience the "**Best of the Best**" achieve World Class Reliability by doing the basics really well. And industry research shows the same.

Research done in the 1990's across a very large group of manufacturing sites around the world found that reactive plants typically achieved uptime of around 83.5%.

That same research found that the best performing manufacturing sites achieved **uptimes in excess of 98%** by focussing on planning & scheduling, preventive and predictive maintenance and defect elimination.

This research, spearheaded by Winston Ledet, lead to the development of the Manufacturing Game (which focusses on defect elimination) and multiple publications.

The table below summarizes the findings of this research:

Tactic	Uptime % change	Uptime	Downtime Reduction
Reactive Plants		**83.5%**	
Planning Only	+0.5%		
Scheduling Only	+0.8%		
Preventive / Predictive Maintenance Only	-2.4%		
All Three Tactics	**+5.1%**	**88.6%**	**30.9%**
Plus Defect Elimination	**14.8%**	**98.3%**	**89.7%**

Source: Manufacturing Game and subsequent work by Ledet [Ledet 1994]

What this shows is that the plants with high uptime achieved this by implementing planning, scheduling, preventive and predictive maintenance *and* defect elimination.

And - in hindsight – this makes perfect sense.

You need planning & scheduling to enable efficient and effective maintenance. Without planning & scheduling you

will find yourself with unnecessary long machine and plant outages.

And you need both elements combined; planning or scheduling on their own do little to drive efficiency. Planning reduces delays during jobs and scheduling reduces delays between jobs. One without the other simply won't work.

Preventive maintenance (PM) and predictive maintenance (PdM) are essential to increasing uptime. They enable you to prevent failures or detect them early so rectification is quicker, less costly and with less impact on overall availability.

And the **biggest finding from the research was the impact of Defect Elimination**, which in essence is making sure 'you fix forever, rather than forever fixing'. So when something fails you make sure it does not re-occur and so over time you reduce the number of failures and increase your uptime.

What is may be surprising is the big impact Defect Elimination has on overall uptime. This tells us that all our plants are full of (hidden) defects that result in failures.

You see, we introduce defects at every stage of a plant's lifecycle. During the design, construction, commissioning of our plants but also during the operation and maintenance phases. If you don't tackle these defects they eventually lead to failures.

Maintenance doesn't address defects and good maintenance can only help you to achieve your plant's inherit reliability. So you need a defect elimination program to remove defects to achieve high reliability. To fix forever rather than forever fixing.

My model for achieving Reliability adds one more element to the equation and that is **Reliability Leadership**.

And that's because I know from experience that without leadership you'll get nowhere.

And I'm convinced that to implement these practices in your organisation, to get results and to sustain those results in the long run you need a focus on reliability leadership and culture change.

KEEPING IT SIMPLE

I refer to my model as the **Road to Reliability™** and it comprises of just 4 Essential Elements:

1. Planning & Scheduling
2. Defect Elimination
3. Preventive Maintenance
4. Reliability Leadership

Implement these 4 practices really well you will make tremendous improvements in your business. You will increase reliability, production, profits and safety.

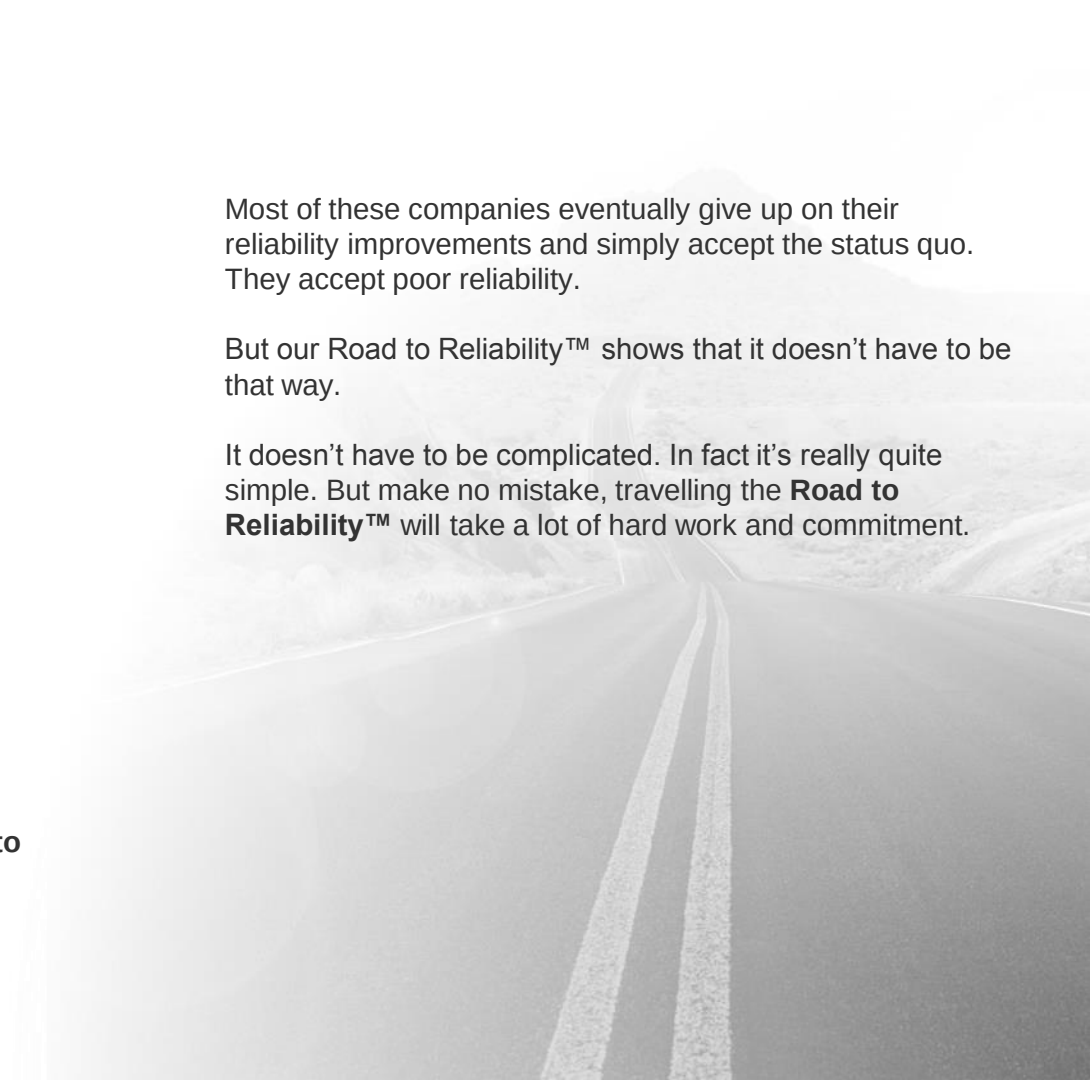
Adopt an overly complicated approach like you commonly see in industry and you lose sight of the essential basics.

I've seen it so many times, companies focus on too many things or the wrong things and lose their way on the **Road to Reliability™**.

Most of these companies eventually give up on their reliability improvements and simply accept the status quo. They accept poor reliability.

But our Road to Reliability™ shows that it doesn't have to be that way.

It doesn't have to be complicated. In fact it's really quite simple. But make no mistake, travelling the **Road to Reliability™** will take a lot of hard work and commitment.



The 4 Essential Elements to Travel

THE ROAD TO RELIABILITY™

PLANNING & SCHEDULING

DEFECT ELIMINATION

PREVENTIVE MAINTENANCE

RELIABILITY LEADERSHIP

FIRST: MAKE A START

The **Road to Reliability™** is in many ways like every long journey. It starts with just a single step forward.

You take that step the day you've had enough. The day you are finally so dissatisfied with the fire fighting, chasing emergency after emergency that you decide to do whatever is necessary to get yourself out of this mess.

And as with every long journey you need to know your destination and have a map to get you there. And that is exactly what this roadmap shows: The **Road to Reliability™**.

Take it. Use it. And get going!

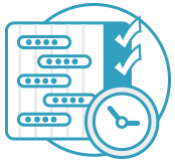
Just remind yourself, this is very much a journey, a marathon, and most certainly not a sprint. It will take time, dedication and persistence.

And yes, everybody's **Road to Reliability™** is different. But what I do know is that everybody who has made significant progress down the **Road to Reliability™** will have implemented these **4 Essential Elements**.

What order you tackle these in depends on where you are today. And what is holding you back the most. The best way to determine that is to do a simple self-assessment or get someone to help you with that and then determine a way forward.

Now, lets explore those 4 Essential Elements in a bit more detail.

PLANNING & SCHEDULING



Soon after you make that first step you will need to implement a Planning & Scheduling process.

Planning & Scheduling is all about maximizing your maintenance productivity by ensuring the right work gets done, at the right place and time, with the right tools, materials and people.

No matter what studies or benchmarks you look at, they all show that typical maintenance productivity or wrench time is somewhere around 30%.

With proper maintenance planning and scheduling you can drive this to 45% and the Best of the Best achieve 50% - 55%.

Increasing your maintenance productivity from 30% to 45% is the same as increasing your workforce by 35%.

Just without hiring anyone!

Getting Planning & Scheduling in place and working well is a critical step in fighting your reactive work environment. It will finally create some space in people's busy schedule for proactive activities. It will help you to stabilize your working environment so you can get ready for your next step on your journey to high reliability.

Unfortunately few organisations get this right. But it really isn't that hard.

Want to find out more?

Check out these online articles:

- Why You Will Fail Without Maintenance Planning & Scheduling
- How to Sell Planning & Scheduling to Your CEO
- How to Implement Planning & Scheduling So it Sticks

DEFECT ELIMINATION

Once you have implemented Planning & Scheduling you will start to see the amount of unplanned work reduce. As you create a more stable work environment, with better planned work, and a sound Weekly Schedule you will find time to think ahead.

As soon as this happens you need to take your next major step forward and implement **Root Cause Analysis and Defect Elimination**.

Root Cause Analysis is all about preventing problems from reoccurring. It's about getting rid of the 20% of issues that cause 80% of your breakdowns, downtime, corrective maintenance and repair costs.

When you encounter a significant breakdown you analyse the failure, determine the root cause and resolve it. You fix it once and for all. Rinse and repeat.

So whilst Root Cause Analysis is all about removing the big ticket items you also need a process for eliminating the smaller, niggly little things.

Because in just about every plant around the world, the little issues add up to a lot.

This is where Defect Elimination comes in. Defect Elimination aims to empower your front line and the wider support teams to independently tackle the many small issues that cause failures.

The beauty of Defect Elimination – when it's done well – is that it drives you towards a **Reliability Culture** in several ways. It removes defects and makes your plant more reliable. But it is also the vehicle to engage a large part of your organisation in reliability.

To make reliability everybody's responsibility – just like safety.

Want to find out more?

Check out these online articles:

- Defect Elimination – Why You can't Do Without
- What an Effective Defect Elimination Process Looks Like
- How to Implement Defect Elimination

PREVENTIVE MAINTENANCE

With Planning & Scheduling under your belt and Root Cause Analysis & Defect Elimination well and truly under way you will soon find gaps in your Preventive Maintenance (PM) program – if you haven't already.

Experience shows that up to a third of the tasks in most PM programs add no real value. Another third would usually benefit from a change of frequency.

And we haven't even talked about the quality of the work instructions!

Simply put, most Preventive Maintenance programs are not very effective and waste a lot of time and money.

But before you tackle your PM program you need to make sure you understand the principles of modern maintenance. You need to understand what Reliability Centered Maintenance has taught us. Understanding the different failure patterns and how to manage these with PM tasks – or not – is the key to building an effective and economical Preventive Maintenance program.

So often I see organisations react to equipment failures or poor reliability by adding more preventive maintenance. And more often than not, more Preventive Maintenance does not help. In most of these cases it does not increase reliability or reduce failures. What it does do, is increase your costs and it can reduce availability.

Although the principles of RCM have been round for 40 years, most organisations and maintenance teams can't seem to effectively apply these principles in their work practices.

But with a bit of effort and probably some training you can soon apply these principles in your organisation so you can do less preventive maintenance yet achieve higher reliability.

Want to find out more?

Check out these online articles:

- The Principles of Modern Maintenance
- Why Preventive Maintenance is Essential to Achieving Reliability
- How to Improve Your PM Program

RELIABILITY LEADERSHIP

When you've come this far in your journey, plant availability is way up, productivity is high and the defects that pop are effectively addressed.

You and the people around you enjoy work more with so much less frustration. And you've noticed that the number of times people get hurt has reduced too – when did that happen?

But by now you'll have also realized that there is no real end to this journey. You'll never get there as there is always something to improve. And so that is what you do. All the time another step forward. Getting better and better.

Continuous Improvement.

You can see that The Road to Reliability must indeed be paved by Leadership.

Leadership and courage is required to move away from the status quo and take your first step.

Leadership is required to determine the vision and stay the course along this winding and sometimes bumpy road.

Leadership is required to overcome the resistance you will encounter along the way – and you will.

Leadership is required to embed all the changes along the way to make sure it all sticks and doesn't become the flavour of last month.

And Leadership is required to know that you are never truly finished.

This is why Reliability Leadership is an essential element in our Road to Reliability™ roadmap. Not just Leadership in general, but specific leadership requirements to make this Journey to World Class Reliability.

Want to find out more?

Check out these online articles:

- Why Are We So Bad At Reliability?
- The Road to Reliability is Paved by Leadership
- Your People Are Not Your Biggest Asset

HOW TO START

For most plants there is a simple and logical sequence to implementing the Road to Reliability™ framework.

Planning & Scheduling Comes First

You start with planning & scheduling to help stabilise your work environment, get on top of your real priorities and make space for some proactive work.

Once you have planning & scheduling embedded you need to focus on Defect Elimination and Root Cause Analysis. This starts to remove the repetitive failures that you are experiencing in your plant. And you'll slowly move from Forever Fixing to Fixing your plant Forever.

Why Defect Elimination is So Powerful

As you go through Defect Elimination you will identify other areas that you need to address. Imagine your plant is experiencing repeated bearing failures, as you get down to the root cause you could find that you have issues with your lubrication program, or you may have an issue with installation practices, there could be vibration issues, your operators may run the equipment outside of the recommended operating ranges or you may be buying wrong or inferior parts.

Defect Elimination and Root Cause Analysis will help you identify these issues so you can resolve them.

And this is exactly how I kept the Road to Reliability™ framework so simple. I'm not telling everyone to work on vibration monitoring and precision maintenance skills and operator care and spare parts etc. Instead with Defect Elimination and Root Cause Analysis it is your Plant that is telling you what you need to focus on. Simple, but highly effective.

Make your PM Program Efficient & Effective

With Defect Elimination under way you will need to focus on your Preventive Maintenance Program. And that's because pretty much every plant at this stage of the journey to reliability will have an inefficient and often ineffective PM program. And you can't afford that. Maintenance resources are scarce and you need to deploy them where it matters most. So review your PMs, get rid of those that don't add value and make sure you're effectively managing your dominant failures modes.

So When Does Leadership Come Into Play?

Although I often address Leadership as the last element in the framework it is by no means the last one you need to address. In fact, it may well be the first area you have to tackle in order to succeed in your journey.

This depends on your plant, your people, your organisation and your culture.

If your Plant is in a bad state and you really need a very large effort to address all these issues – and this is often the case – you probably need to tackle Reliability Leadership first.

You'll need to get leadership on board with the journey to reliability. You'll need to get support for extra resources – people, money and time.

If you are unlucky enough to work in a plant where the situation has been bad for a long time, you may not have leadership that is open to these kind of changes. In that case it's often best to try and get a number of small, quick wins under the belt to demonstrate the value of reliability to your leadership.

What you focus on with these quick wins depends 100% on your plant's situation and it could be in any of the three areas: Planning & Scheduling, Defect Elimination or Preventive Maintenance.

Often removing some of the frequent failures from the plant's production line using simple Defect Elimination and Root Cause Analysis techniques can be very helpful in gaining support.

By removing a frequent failure you can easily show the increase in uptime. That should lead to an increase in production. And more production is more profit. And leadership is always interested in more profit.

Another reason you may need to start with Reliability Leadership first is to ensure your Maintenance & Reliability group has sufficient leadership and business skills to implement the three areas of Planning & Scheduling, Defect Elimination and Preventive Maintenance.

FINAL WORDS

Sure, there is much more to reliability than just the 4 essential elements.

But my objective with the Road to Reliability™ framework is to help you focus on what truly matters and not get distracted by the many different tools, solutions, software packages etc. that are out there.

Focus on these 4 basics, get them working, get really good at them. Then and only then should you consider progressing into other areas. Sure there will be exceptions to this rule, but for the vast majority of us this simple approach to reliability will yield big results!

Want to continue the discussion?

No matter where you live or work you can reach me at: www.roadtoreliability.com/contact or drop me an email at erik@r2reliability.com

© 2017 ROAD to RELIABILITY. All Rights Reserved.

THE ROAD TO RELIABILITY™

starts with just a single step

Start Today