Moving from a Repair-focused to a Reliability-focused Culture

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Summary

This paper will discuss the five key elements required to successfully transition from a traditional, repair-focused organisational culture, to a proactive, reliability-focused culture, and reap the rewards of increased performance of both equipment and people.

- Ensuring a Long-Term Strategic Focus
- Aligning Reward Systems with Strategic Goals
- Better Integration between Production and Maintenance
- Creating Opportunities for Teamwork and Organisational Learning
- Strong, Committed Leadership

Based on our experience, most culture change initiatives will fail without all of these elements being present.

Introduction

Most maintenance organisations are looking to move their culture from a repair-focused culture to a reliability-focused organisation – but what are the characteristics of each of these types of culture? Some of these characteristics are listed in the following table.

Repair Focused	Reliability Focused
Fix it	Improve it
Firefight	Predict, Plan, Schedule
Tradesman	Business Team Member
Manage defects	Eliminate Defects
Reduce Maintenance Cost	Increase Uptime
Program of the month	Continuous Improvement
Believe failures are inevitable	Believe failures are exceptional
Give priority to breakdowns	Give priority to eliminating failures
Many failures	Few failures
Low level of planned work	High level of planned work
High level of rework	Low levels of rework
Poor reliability	High reliability
High maintenance costs	Low maintenance cost
Short term plans	Long term plans
Become non-profitable	Attract new investments

This paper outlines five prerequisites for moving from the left hand column to the right hand column of this table.

Ensuring a Long-Term Strategic Focus

The first point to make about Organisational Culture is that changing it is not a short-term activity. Significant, sustainable change in organisational culture can take at least 5 years in most organisations. Given the propensity of some organisations today to rotate managers through operational positions with a two-to-three year spell in any

one position, it is unlikely that any one manager will succeed in significantly and sustainably changing the culture within their area of responsibility – but many try.

What is required is a constancy of purpose that transcends short-term fluctuations in organisational circumstances, and changes in personnel. This requires that this sense of purpose is "internalised" within all personnel within the organisation – everyone is committed to, and driven by, the achievement of this purpose, or goal. For this to occur, the purpose or goal must be inspirational – it must appeal to our higher order psychological needs and wishes. It goes without saying, that for this purpose to appeal to us, achievement of the goal must provide "something in it for us" for all within the organisation. And a critical role required of a leader within the organisation is to formulate this goal with reference to the needs of those working within the organisation, build commitment to the goal, and use the goal to shape the future organisation.

Collins and Porras, in the Harvard Business Review of September/October 1996, described this as the "Core Ideology" of an organisation. They argued that this "Core Ideology" could be considered to consist of two parts – Core Values (which consisted of 3-5 timeless guiding principles which require no external justification, they have intrinsic value), and a Core Purpose, which is a simple statement which captures the organisation's reason for being, and reflects people's idealistic reasons for doing the company's work.

In this article, they gave examples of organisations' core values and core purposes as follows:

Core Values
Sony
- Elevation of the Japanese culture and National status
- Being a pioneer - not following others, doing the impossible
- Encouraging individual ability and creativity

Walt Disney
- No cynicism
- Nurturing and promulgation of "wholesome American values"
- Creativity, dreams and imagination
- Fanatical attention to consistency and details
- Preservation and control of the Disney magic

Core Purpose
Sony
- To experience the joy of advancing and applying technology for the benefit of the public
Walt Disney
- To make people happy
3M
- To solve unsolved problems innovatively
Nike
- To experience the emotion of competition, winning and crushing competitors

It is the role of a leader to identify and nurture these core values and purpose, and through the identification of, according to Collins and Porras, Big Hairy Audacious Goals (BHAG's) that are consistent with these value and purpose, make them more tangible, and use them to drive the organisation forward with unity of purpose.

These BHAG's can have several forms, including:

Qualitative
- Democratise the automobile (Ford, early 1900's)

Quantitative
- Become a $125 billion company by the year 2000 (Wal-Mart, 1990)

Common enemy thinking
- Crush Adidas (Nike, 1960's)

Role model
- Become the Harvard of the West (Stanford University, 1940's)

Internal-transformation
- Transform this division from a poorly respected internal products supplier to one of the most exciting, respected and sought-after divisions in the company (Components Support Division of a computer products company, 1989)

Consider your own organisation, for a moment. What are the core values and core purpose of your organisation (or your department or work team) – and what is its BHAG? What is your organisation/department/workgroup's long-term plan for achieving your BHAG? If you have trouble clearly defining these, then you leave yourself open to random external influences, forever drifting from one "Program of the Month" to the next, and constantly making large scale changes in reaction to relatively minor external events.

Aligning Reward Systems with Strategic Goals

Any form of change initiative must successfully address the question of "what's in it for me" for those being asked to change. In other words, there must be some form of greater reward for individuals and groups if they adopt the new, desired behaviours, than if they continue to behave in the old, undesirable way. These rewards can be both financial and non-financial, but the most successful change initiatives incorporate a blend of the two.

It is also important to assess the existing financial and non-financial reward systems, and identify any elements of the existing reward systems which are incompatible with the desired behaviours.

Another way of viewing the journey from Repair Focused to Reliability Focused culture is that outlined by Ledet, as illustrated in Figure 1.

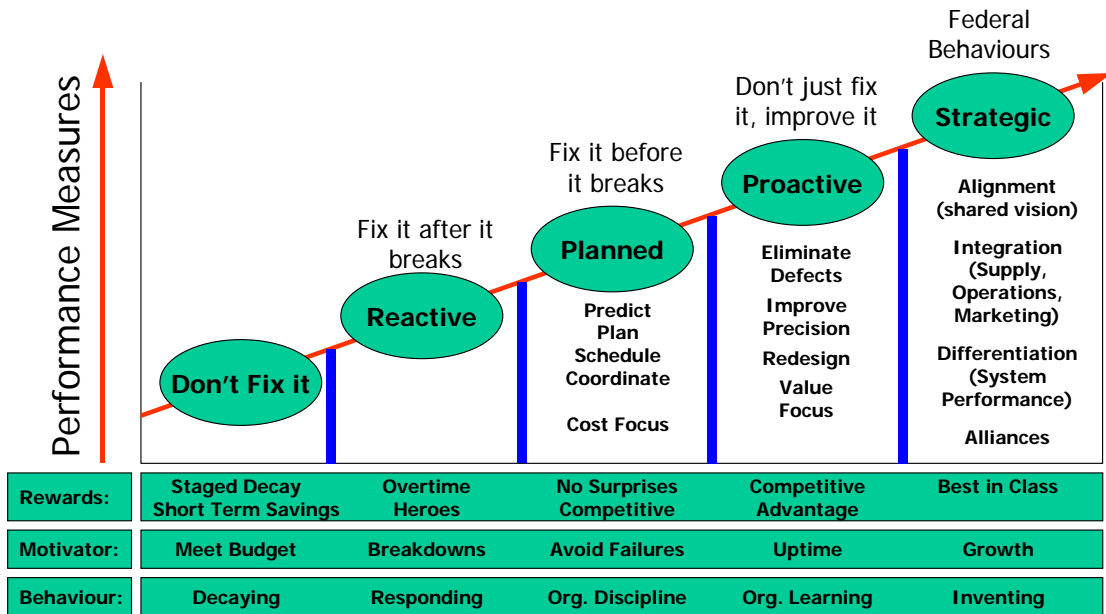# Journey from Repair-focused to Reliability-focused Culture

Performance Measures →

Federal Behaviours

Strategic
- Alignment (shared vision)
- Integration (Supply, Operations, Marketing)
- Differentiation (System Performance)
- Alliances

Don't just fix it, improve it

Proactive
- Eliminate Defects
- Improve Precision
- Redesign
- Value Focus

Fix it before it breaks

Planned
- Predict
- Plan
- Schedule
- Coordinate
- Cost Focus

Fix it after it breaks

Reactive

Don't Fix it

Rewards:	Staged Decay Short Term Savings	Overtime Heroes	No Surprises Competitive	Competitive Advantage	Best in Class
Motivator:	Meet Budget	Breakdowns	Avoid Failures	Uptime	Growth
Behaviour:	Decaying	Responding	Org. Discipline	Org. Learning	Inventing

Figure 1

There are several things to point out in this model, in terms of incentives and rewards.

First, put yourself in the position of being a tradesperson in a Reactive maintenance environment. There are a number of personal rewards associated with working in this type of environment, such as:

- The challenge and variety associated with never knowing what you will be working on next
- The financial rewards associated with overtime and callouts
- The personal rewards associated with being the "hero" that can fix breakdowns as quickly as possible, and get the plant back on-line
- The satisfaction of being able to, at short notice, respond to the demands of production personnel – some would call this having a "customer focus"

If you then move into the Planned maintenance phase, with its focus on systems, rules, procedures and discipline, then all of these rewards disappear. In its place, from a tradesperson's view, is routine, inspections, and minimal challenge. As one tradesperson once said to me – "It's like Groundhog Day". While there may be some people who relish the certainty that goes with this routine and discipline, it is unlikely to be the same type of person that thrives in the semi-chaos of a reactive maintenance environment – so there is a need to provide tradespeople with different rewards to replace those which they are now missing out on.

A clear candidate, in order to align rewards with desired behaviour, is to remove the payment of overtime for callouts and for performing unplanned work. The best maintenance organisations in Australia now pay tradespeople a fixed salary, rather than hourly rates, thereby removing the financial reward associated with breakdowns and after-hours rework. At another organisation, moving tradespeople from hourly rates to fixed salaries had an immediate effect on shopfloor attitudes to callouts – where previously, tradespeople would, without question, attend to a callout, on the

change, tradespeople would question the need for a callout, and take a proactive role in minimising the number of callouts required.

Other rewards that could be provided include the payment of bonuses for the achievement of target levels of planned work, reliability targets or other measures of desired performance – or providing awards or celebrations for these achievements, in the same way as many organisations already do for the achievement of safety targets.

Once the organisation moves from the Planned maintenance phase into the Proactive environment, then the opportunity exists to provide additional non-financial rewards associated with involvement in problem solving, the acquisition of additional skills associated with a focus on precision maintenance and the minimisation of rework – but even here, managers need to be sensitive to the possible concerns of tradespeople that their involvement in these types of activities will ultimately lead to downsizing of the workforce and them, or their workmates, being made redundant. Once again, those organisations that have been successful in moving into this phase frequently use contractors to perform less critical, and less skilled, maintenance tasks, and use this pool of contract labour as the source for any job reductions – thereby minimising any negative feelings that tradespeople may have towards involvement in these activities.

What about the situation in your organisation? Put yourself in the heads of your people – engineers, maintenance supervisors, tradespeople, production supervisors, planners? What are the financial and non-financial rewards that these individuals receive from the work that they do? Are these consistent with the new behaviours and culture that you are trying to encourage? What can you do to remove financial and non-financial rewards that are inconsistent with desired behaviours? What can you do to introduce financial and non-financial rewards that encourage new, desired behaviours? Unless you successfully address the question of "what is in it for me", then any process and systems changes will ultimately be unsuccessful.

Better Integration between Production and Maintenance

Another clear differentiator between those organisations that are achieving a more reliability-focused culture and those that are not, is the level of teamwork and cooperation between Maintenance and Production personnel.

Once again, refer to Figure 1.

In a Reactive Maintenance environment, the interaction between Production and Maintenance is pretty simple. Production says "jump", and Maintenance says "how high?" Once again, some people would refer to this as being "customer oriented" – I would call this being a slave to Production's whims.

As organisations move into the Planned Maintenance environment, however, the nature of the relationship between Production and Maintenance changes. If Maintenance is to effectively schedule routine maintenance tasks (PMs, inspections etc.) as well as planned repairs, then it must reach agreement with Production regarding the most appropriate time to perform this activity, and Production must ensure that the equipment is shutdown, isolated, and in some instances, cleaned, ready for maintenance. In this case, it is Maintenance now initiating the request that

Production perform some activity – communication and customer orientation is no longer all one way.

As we move even further up the path to Reliability, and we start to embrace such principles as Reliability Centred Maintenance (RCM) and PM Optimisation (PMO), there is a recognition that there is a need for a better definition of maintenance. In accordance with the principles of RCM, maintenance can be defined as:

> "*any activity carried out on an asset in order to ensure that the asset continues to perform its intended functions, or to repair the equipment*"
> (*www.plant-maintenance.com/terminology.shtml*)

If we adopt this definition, then which of the following activities are actually "maintenance"?

- Routine cleaning
- Visual inspections
- Minor adjustments
- Setpoint adjustments
- Condition Monitoring
- Equipment Performance Monitoring
- Overhauls
- Repairs

And who actually performs these activities? In most organisations, it is both operations/production and maintenance personnel. In fact, it can be argued that, in most continuous process operations, most of the work that Production personnel do is actually "maintenance". At a maintenance conference earlier this year, in fact, Moubray (accurately, in my view) described most production operators as being "machine minders" – in other words, most of their work is associated with making sure that machines "continue to perform their intended functions".

So in using RCM and PMO processes to determine the optimal "maintenance" program for plant and equipment, there is an explicit need to involve both maintenance and production personnel, and arrive at an appropriate division of responsibilities between the two groups.

The concept of "operator/maintainer" is also one of the concepts within Total Productive Maintenance (TPM) processes.

And finally, as we move into Proactive Maintenance techniques, such as Failure analysis and elimination processes, effective use of these techniques leads us to understand that "sometimes things break, and sometimes they get broken". That is, that the way equipment is operated, and the environment within which it is operated, is often the reason for equipment failure, rather than any equipment-specific issues. In the civil aviation industry, for example, equipment failure is currently responsible for less than 15% of air crashes – the remainder is due to "pilot error" and environmental conditions. A focus on failure elimination forces us to think more carefully about:

- Ensuring that we are using the right equipment/components for the job (requiring better teamwork between Maintenance and Engineering), and
- Ensuring that equipment is operated within its design envelope (requiring yet more teamwork and cooperation between Maintenance and Production)

Building that teamwork is an absolutely vital part of moving to a Reliability-Focused culture.

Creating Opportunities for Teamwork and Organisational Learning

Of course, there is little point in having a strategic vision of where you want to go, combined with fully aligned reward systems, unless you actually allow your people, at all levels, to learn and then apply their new learning to their realm of influence. We are fortunate here, because consultants and vendors have created a wealth of tools and techniques which, if properly implemented, can allow the acquisition of new knowledge and skills, and then permit the application of these new skills.

The challenge facing maintenance managers today is not in finding methodologies and approaches to apply, but in understanding how they all fit together. It also lies in making sure that the application of these approaches are not seen as the latest fad, project, or "flavour of the month", but are fully adopted and internalised within organisations, and simply become "the way we do things around here" in certain, appropriate, situations.

Despite the overconfident claims of some consultants and vendors, there is no, single tool, software package or methodology that will solve all your problems, and magically transform your organisation overnight into a truly reliability-focused organisation. Every organisation is different, and faces its own challenges. Industries are different, people are different, their histories are different. Thank goodness for that – life would be pretty boring if that weren't the case!

Having said that, though, there are some tools and techniques that are more likely to be applicable in certain situations. Once again, with reference to the Ledet path from Repair-focused to Reliability-focused culture, Figure 2 below outlines a possible way of looking at some of these tools and techniques, and where they may apply in this journey.
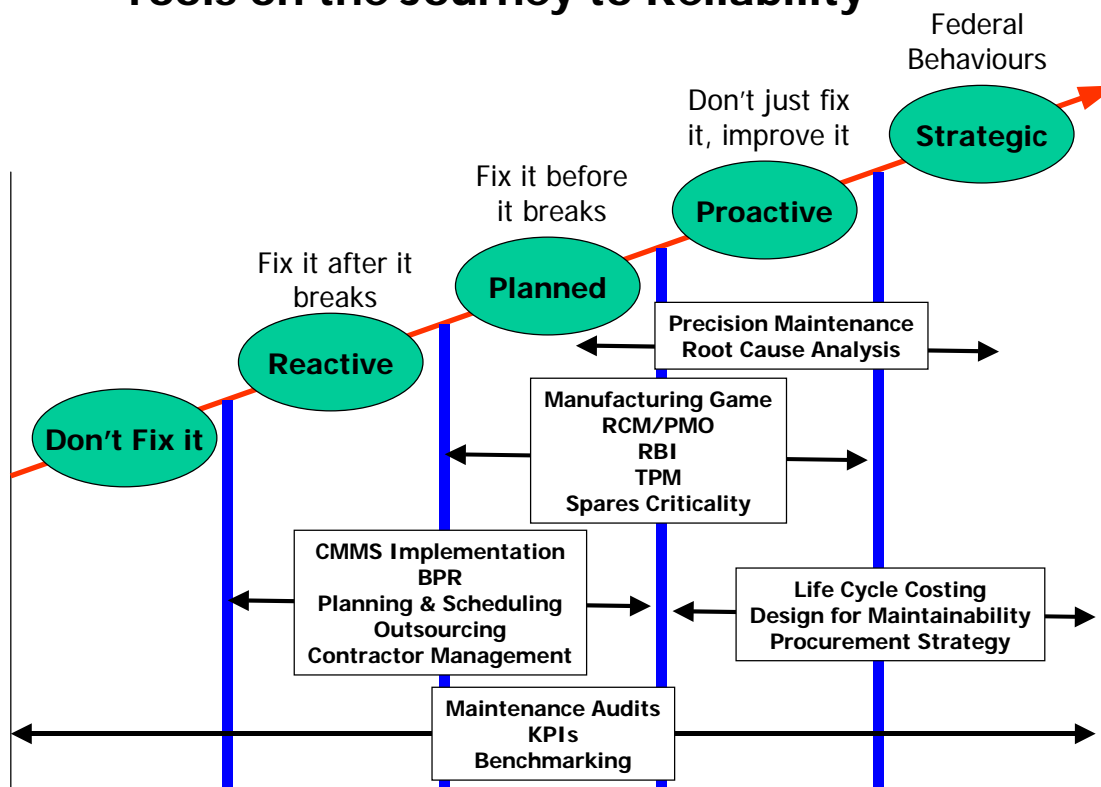
Tools on the Journey to Reliability

Figure 2

Many of these tools, methodologies and techniques lend themselves to the provision of opportunities for building teamwork between Production, Maintenance and Engineering personnel at all levels. Many also provide the opportunity for the acquisition of new, higher level skills among maintenance tradespeople and plant operators. Effective maintenance managers will select the tools that are appropriate to their situation, and ensure that these opportunities for engagement and growth amongst personnel at all levels within the maintenance and production organisation are fully adopted where appropriate. They are also likely to ensure that disciplines, systems and procedures are in place to ensure that the application of these approaches are consistently applied, on an ongoing, long-term basis, when it is appropriate to do so.

There is not sufficient time or space to discuss all of these methodologies and approaches in detail, but I would like to take the opportunity to discuss one or two of these, albeit briefly.

There is hardly likely to be a professional maintenance manager today that has not heard of Reliability Centred Maintenance – RCM. For many who have tried it, RCM stands for "Resource Consuming Monster". Yet the underlying engineering principles, and the fundamental implementation philosophy of RCM are sound. It relies on the application of a breadth of knowledge regarding the operation and maintenance of a piece of equipment through small, multi-disciplinary teams, usually involving experienced shopfloor tradespeople and operators, as well as other people who have technical knowledge of the equipment, such as engineers, supervisors, and

vendors. As such, the training and implementation approach associated with this tool provides an outstanding opportunity for organisational and individual learning and growth. It's just a pity that it takes so damn long to do the analysis!

An alternative approach to the implementation of RCM principles, which also embodies the same philosophy of using small, multi-disciplinary work teams, but which applies these principles in a far more time-effective manner, and results in similar, or better, results in almost all situations, is PM Optimisation. At a Maintenance conference in Sydney last year, Ray Craddock from Santos presented a paper describing how they had used the PM Optimisation approach to drive towards a more reliability-focused culture. I recommend that you read this paper – it is available at
www.pmoptimisation.com.au/downloads/reliability_is_a_culture_not_a_department.zip.
Once again, the combination of effective training, plus the establishment of focused implementation teams provides a highly valuable opportunity for individual and organisational learning and growth at all levels.

Several Root Cause Analysis techniques also promote the use of small, multi-disciplinary teams to solve, and eliminate, both one-off, catastrophic "failures", and repetitive chronic failures. Foremost amongst these are the SIRF Roundtables approach to Root Cause Analysis (RCA Rt), and the Apollo method. Again, the secret to success in using these techniques is to ensure that people are properly trained in their application, and then to establish the organisational disciplines and procedures that ensure that these approaches are used whenever an appropriate situation arises that justifies use of a Root Cause Analysis tool.

Strong, Committed Leadership

Having discussed what I hope you will agree are some fairly important, and practical principles, who is going to make this all happen?

You are!

It doesn't matter where in the organisation structure you are, whether you are a tradesperson, or a manager, an engineer, or a planner – you have the capability to influence others – and this is at the core of leadership. And unless you happen to be the chairman of the board, you will always be operating within the constraints placed upon you by others, higher in your organisation (and even the chairman of the board ultimately has to answer to the shareholders of the business).

Certainly, your position in the hierarchy will determine the scope of your influence, but managing upwards is an important part of effective leadership. I have met very few organisations where those at lower levels are actively discouraged from taking initiative, and making improvements, even when those improvements are slightly outside their "official" areas of responsibility. In my experience, most supervisors and managers are actually slightly relieved when one of their people grasps some responsibility and makes some improvements (as distinct from just talking about making improvements, or worse, talking about how it is somebody else's responsibility to make improvements) – normally because it is one less thing that they themselves need to worry about. Most of the barriers that we raise that we consider

prevents us from making changes are actually self-imposed. But before you suddenly all turn into megalomaniacs, take small steps first.

So what are these steps of leadership that you can take.

First, you can take steps to improve your knowledge of the various tools and improvement methodologies that are available, and whether, and how, they may fit your organisation in its path from repair-focused to reliability-focused. The fact that you are reading this paper is a good start! Remember that there are no "silver bullets", and that the most effective, holistic solutions will come from within you and your organisation (although external parties may be able to assist you to find those solutions for yourself).

Second, you can ensure that your own personal actions are consistent with a reliability-focused culture – there is nothing like leadership by example! Do you encourage "quick fixes" and temporary repairs, or quality workmanship and precision maintenance? Do you bend to the first attempt by production to defer routine maintenance, or do you educate, encourage and coerce production into greater adherence to the agreed schedule?

Third, you need to be persistent. It is highly unlikely that the first time you push back against production (or against your supervisor/manager) in your attempts to generate a more reliability-focused culture that they will suddenly say "yes, you are right, and I have been wrong for all these years"! So be prepared for knock-backs and rejection, and have courage in your own convictions – the first point above can help in this regard.

Fourth, invest time in building relationships with people that can assist you in your reliability improvement efforts – and once you have built a strong relationship with them, then talk about the issues, what you are trying to achieve, and how they may be able to help you. Trying to do this in the opposite order is a recipe for failure.

Fifth, be flexible. Remember that others also have valuable contributions to make, and that you are not necessarily the source of all wisdom. Be prepared to constantly seek opportunities to improve your plan, actions and vision, and incorporate the good ideas of others.

Sixth, reward others for taking actions towards the reliability-focused goal. Clearly, the further up the organisational food chain you are, then the greater your ability to do this, but rewards can take any form, from a simple "well done", to a couple of movie tickets, to a team barbecue, to a formal "employee of the month" scheme.

Seventh, tell others about the good things that people you know have done which have helped to improve plant reliability. There is another paper being given in this conference which covers the power of story-telling as a culture change tool, and I wholly endorse this viewpoint. Look for opportunities to tell stories that illustrate examples of what you are trying to achieve, and make sure that the stories get told frequently, and to many people.

Clearly, if this leadership comes from the top of the organisation, then the speed of cultural change will be much greater, and far more wide ranging – but it is up to all of us to "do our bit" to initiate moves towards a reliability-focused culture within our own realms of influence, and to bring our bosses along for the ride!