

A quicker way to improve maintenance costs and performance for owner – operators.

Overview

- Breaking the reactive maintenance cycle requires a bottom-up, back-to-basics approach
- The approach must be tailored to local operating conditions, but remain consistent with corporate standards
- The reactive cycle can be halted in 12 weeks with improvements possible soon after



Many owner-operator mines are struggling to meet their production targets due to an increase in the volume and frequency of unplanned downtime events across their value chains, from mobile fleets through to fixed plant assets. In addition to lost production, excessive downtime drives a substantial increase in maintenance costs and unplanned capital requests. It is no secret that the root causes can be traced back to poor maintenance and operational practices. These practices need to be underpinned by robust systems and processes but surprisingly, many mines still struggle to get those components “right”. Often, attempts to resolve this situation involve trying to implement the “traditional” centralised rollout program that can often take years to implement. Meanwhile maintenance performance continues to suffer.

An obvious, and arguably more efficient and effective, alternative is to get “back to basics” – stabilise core planning and execution processes, and agree operating imperatives. MHC observes a key problem in getting “back to basics” is that many sites are trying to work to corporate standards that, while clearly beneficial when embedded, fail to take into account the transition period of implementation, local considerations, as well as differing site maturities within the portfolio. In short, it is top-down and too complex.

A number of mines are currently achieving success by taking a coordinated, bottom-up approach that supports the corporate standard in the long term but provides a short-term “bridge” that helps reconnect and refine it while, at the same time, delivering tangible results. Although the timeframe to achieve break-even on implementation costs can be highly variable – from almost immediately to longer term (depending on the complexity of the changes required) – this practical approach is seeing stabilisation being reached within 12 weeks with corresponding upswings in performance being achieved in similar timeframes.

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Getting back to basics – what does it mean?

The “basics” of Maintenance lie in three key domains: people and structures; core processes and interfaces; and supporting systems and tools. When these core components intersect, maintenance runs smoothly, but when they do not, it is difficult to stop the reactive slide.

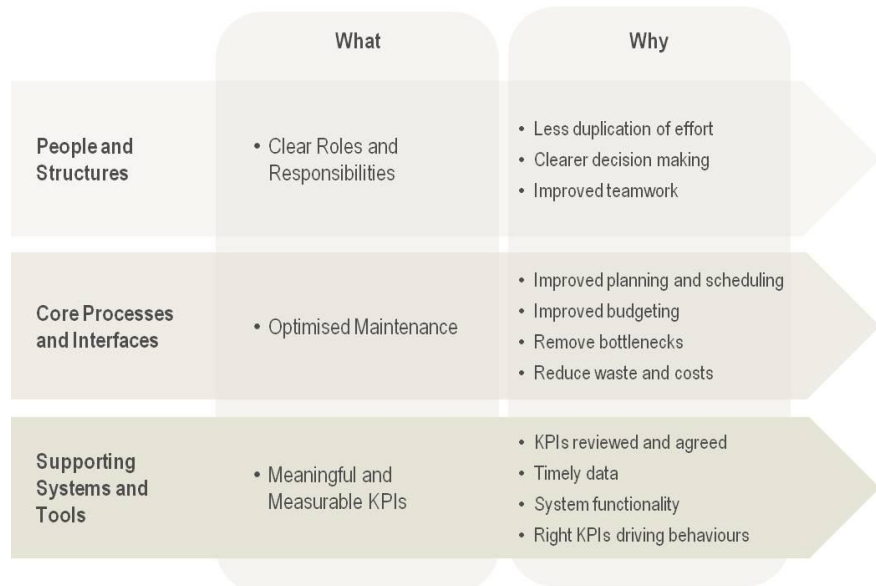


Figure 1: Back to basics – the three cornerstones of an effective Maintenance improvement plan

People and structures

The start of any solution requires stakeholder engagement across both Maintenance and Production teams. Potential solutions are generally viewed by these teams as long term and cumbersome, creating more problems than they resolve. It is also difficult for teams to focus on these goals when they are seeking immediate support, while managing the demands of the latest operational “emergency”. True engagement and resolution is only possible when clear, timely and practical solutions are proposed.

A lack of clarity around roles and responsibilities, driven by non-existent or poorly communicated position descriptions, causes confusion and unpredictability, as well as duplication of effort and low process compliance. A comprehensive program of initial and ongoing training and communication regarding role expectations and core responsibilities needs to be in place, with an emphasis on not just technical skills, but the importance of procedural training and competencies.

Processes and interfaces

In a large multinational company, processes are usually standardised across all sites to allow effective management and decision making at a regional level, as well as internal benchmarking. The processes also dictate the critical data capture points, thus determining reporting and performance indicators. These global standards are typically too high level and contain little practical detail to enable effective management at site level.

To bridge this functional gap, site- or region-specific procedures – that sit within the global standard – should be developed and managed locally. Having a procedural approach will assist in achieving and maintaining higher process compliance and control. In addition, if the ownership and direction of site-level procedures is handed to the local team, willingness to implement the procedures – and the process by extension – will increase dramatically. Procedures should clearly designate responsibility by role type and department: indicating reporting requirements, key data collection points, and reference to local documents and structures. By reviewing the global standards and adding additional detail and decision points where applicable, functional and highly-effective procedures will be developed.

There is also a significant difference between fixed plant and mobile equipment maintenance in terms of procedures, interactions with Production, and work planning. Procedures should incorporate these nuances to avoid confusion and mitigate the potential safety risks. For example, minor repairs in a fixed plant scenario are often executed by the Operator, a practice which is unacceptable in some mobile equipment maintenance situations where a certified tradesperson is required.

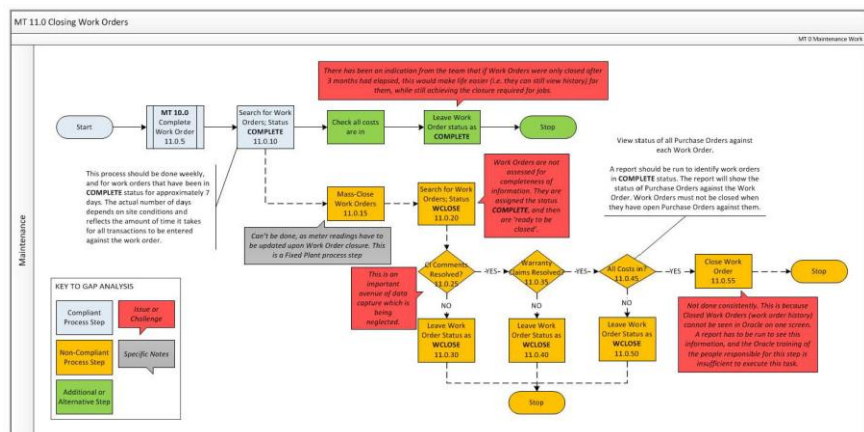


Figure 2: A gap analysis and issue overlay showing the non-applicable and additional or alternative process steps forced by a 'one size fits all' regime (click diagram to enlarge)

There is a high administrative requirement on any employee in a supervisory role; they have to rely upon the process to highlight substandard, incorrectly prioritised or missed work. Similarly, this applies to accurate data capture and management. Maintainers assign hours to work orders to appear 100 per cent productive, and while managers and supervisors know the work recorded is not accurate, they have no measure to report or manage this practice.

In an attempt to alleviate the quantity of administrative tasks to be completed, it is common to use a standing work order – extending for a month – to cover daily services. Although this practice saves time on unnecessary additional administrative requirements, the transparency over the execution of these work orders suffers. Many sites see these monthly work orders closed out with uniform and static hours which do not necessarily reflect the actual hours worked. When the cost of these maintenance hours are assigned to the assets, life cycle costing and budgeting are all affected.

Many mines have also moved away from regular comprehensive services, relying on a completed program of daily services to delay fully servicing machines to every 250 hours. Budgets and work planning relies upon the data captured during the work order completion and close out processes; if the data is not accurate, the budgeting and planning is fundamentally impacted.

Processes and their interdependencies are the cornerstone of effective functional interfaces. In particular, the interface between Production and Maintenance can suffer from a "master-servant" relationship with single-direction communication flow. The relationship must be mutually respected and cohesive with the early agreement of operating imperatives and key plans and schedules being crucial. This requires both parties taking the long-term, rather than the short-term, view of production and maintenance priorities. In the long run, both will benefit.

It is also imperative to have comprehensive and accurate audit functionality within processes so compliance can be regularly and readily assessed. Poor work practices can then be identified and addressed in a cycle of continuous improvement, being wholly managed at site level. In addition, the relationship between processes and associated responsibilities needs to be continuously reviewed and completely aligned – too often, position descriptions and performance metrics do not support this with explicitly stipulated process compliance targets.

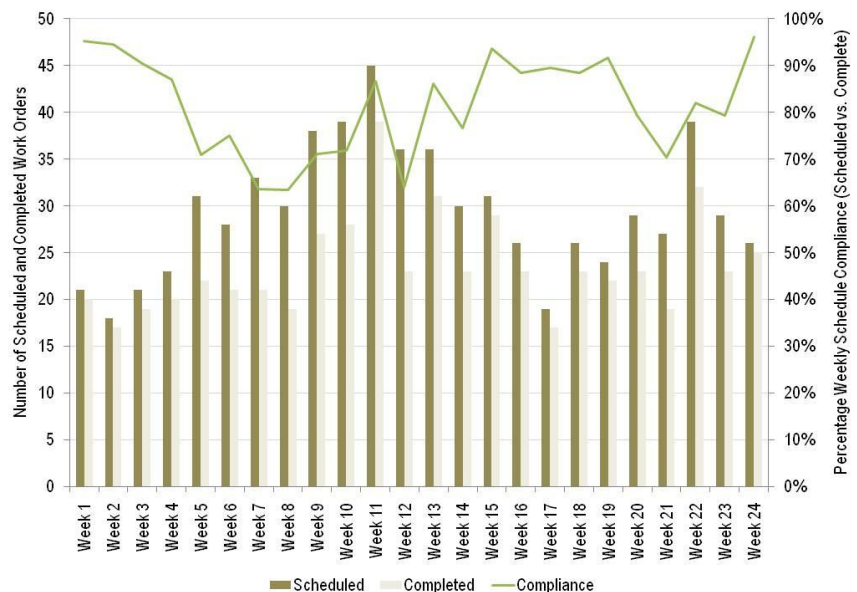


Figure 3: Process compliance reporting review must be completed at a minimum to support basic process management

Supporting systems and tools

While it is widely acknowledged that successful system implementation demands extensive and comprehensive pre-work and scoping, it rarely meets this basic requirement. Successful system scoping must involve high levels of engagement and consultation with site-level users to determine functional and non-functional system requirements. These are the future users of the system, and they hold the experience and knowledge of current constraints, bottlenecks, and challenges. Scoping should also consider the nuances of different locations and working environments contained

within the company to ensure basic requirements are met.

The quantity and magnitude of “bolt on” systems is a solid indicator of the inadequate level of the initial system scoping. With every additional tool required, the number of manual interfaces increases, the training requirements grow, and the overall process efficiency and compliance suffers – ultimately preventing continuous process improvement, robust asset management, work planning, and budgeting.

Data capture, integrity and management are the cornerstones of a successful system implementation. Data structures and planning, including both future data requirements and historical data transfer (standard jobs, asset hierarchies and activities, as well as equipment histories), must integrate with central asset management systems but at the same time be driven by site-level applications. Ultimately, the system must support the capture of work order history to enable analysis, improved decision making and process optimisation.

The training and education process for implementing a new system must be effective both short and long term. Initial training is critical, but this must be built upon by ongoing refresher system training. Where the number of employees who are confident in system use is low, misinformation and divergence in processes can permeate the group as these employees tend to train their successor and their direct reports. Breaking and realigning ingrained processes is often a far greater challenge than ingraining the correct processes in the first instance.

Finally, every person must be made accountable for their role in the process by having clear, process-focused KPIs in position descriptions, which can also enable managers to track performance. Effective KPIs in a position description for a Maintenance employee should be specific to include such numbers as service compliance, schedule compliance, defect management and identification, and mean time before failure. KPIs should cascade from the Maintenance group down through the levels of management to the frontline, ensuring the department’s objectives are clearly outlined.

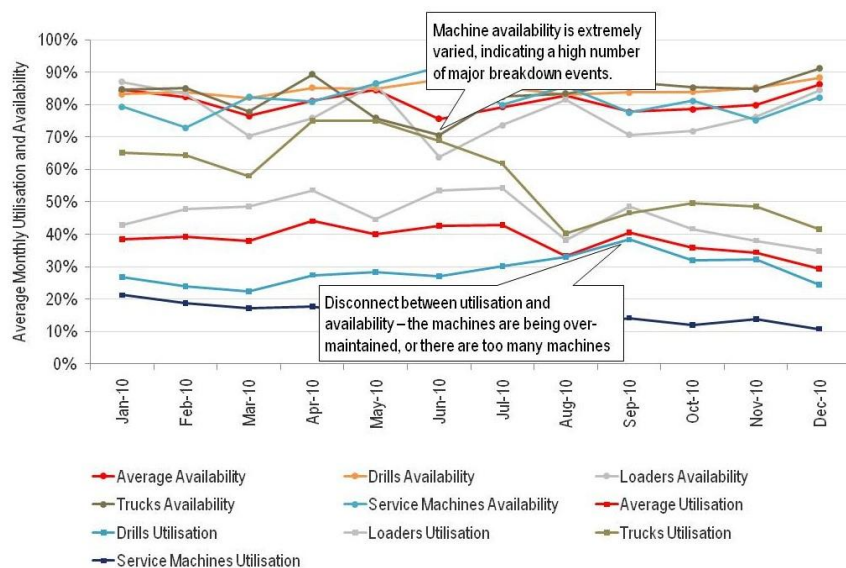


Figure 4: High level KPIs can highlight disconnects for resolution but more specific numbers also require review to drive accountability (click diagram to enlarge)

Maintenance exists for the sole purpose of ensuring the plant is maintained and available to mine, process and transport product. This can be difficult when key plant availabilities are under intense pressure, as unorthodox maintenance and operational practices normally arise which have a direct short- and long-term reversal effect on maintenance performance. It is vital that the essentials (operating imperatives, priority work order planning and execution, work order reviews, FMECAs etc) are still followed when there is an urgent rush on production. Without it, availabilities will only continue to fall and create an even worse situation long term.

To meet operational performance targets, practical solutions must be implemented which effectively support the site but, at the same time, ensuring there is still a bridge with corporate standards. This can be difficult due to the antagonistic nature that can arise from a corporate rollout timetable clashing with the site requirements and capabilities. This must be monitored with clear two-way communications, and the workload balanced to reduce frustration and ensure the program keeps moving.

Finally, MHC observes that often the most appropriate and effective approach to resolving key issues as those mentioned previously, is drawing from the valuable experience and knowledge of those stakeholders who are impacted by it on a regular basis. Guided by that underpinning principle, any successful solution to spiralling maintenance costs and poor performance needs to be built from the knowledge, insight and initiative contained at a site level and integrated into the local planning and execution of people, structures, processes and systems improvements.

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Stabilising the slide and turning things around – the timing and benefits

The timeframe for resolution and improvement depends on the scale of the operation, complexity and breadth of the issues faced, the inherent culture, its propensity to change, and the existing competencies within the Maintenance team. Whereas achieving break even on implementation costs can be variable, typically, the reactive cycle can be stabilised within 12 weeks and performance improvement possible in a similar timeframe.

Ultimately, addressing these issues will improve plant and machine availability and life cycle costing. Beyond these two critical benefits, attending to the issues also results in a culture shift from a reactive breakdown culture to one where a proactive and preventative mindset is adopted. Planned work of course is always a lot cheaper than unplanned work.

Resolving persistent issues in all three “back-to-basics” domains drives higher process compliance, resulting in process improvement and gains in efficiencies. By sharing these improvements between sites, the benefits can permeate through a region. Higher process compliance also drives accurate data collection and management, allowing accurate and robust budgeting practices and work planning to occur. The work planning improvements will then drive targeted and improved work identification practices, by ensuring the new work is effectively prioritised and critical

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information feeds back into the decision-making process.

A “back-to-basics” approach, built from the bottom-up is an obvious choice for those who work in Maintenance delivery facing sliding or highly-variable performance. Resolving the conflict in thinking and approaches between operational and corporate groups is the first step to stabilising maintenance effectiveness and improving performance.

Marchment Hill Consulting has offices in three locations which serve Australia and New Zealand, Asia and the Middle East.

Melbourne

Level 4
530 Lonsdale Street
Melbourne VIC 3000
Phone: +61 3 9602 5604
Fax: +61 3 9642 5626

Brisbane

Level 5
199 George Street
Brisbane QLD 4000
Phone: +61 7 3012 7242

Perth

Unit 14
123a Colin Street
West Perth WA 6005
Phone: +61 8 9322 5422

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