

# Chapter 1

## INTRODUCTION

Doubling of share prices, putting a man on the moon, turning an old refinery into a world-class facility and improving safety are all outcomes that have been delivered by implementing asset management. In the tree metaphor, these are some of the fruits and seeds of asset management.

The efficient and effective use of physical assets is a key enabler that allows organisations to perform well: they can lower cost and risk, and elevate performance and share price when managed correctly. Assets exist to provide value to the organisation and its stakeholders, and it is how the organisation manages their assets that will determine the realised value. Key determinants that support the management of physical assets – the environment and the soil (nutrients) – are the right leadership, behaviour and associated workplace culture, as described in the preface.

### 1.1 A Brief Introduction to Asset Management

To set the context for the need for right leadership, behaviour and associated workplace culture, it is important that we outline the key concepts and fundamentals of asset management. For readers who want further information, there is much excellent material available in ISO 5500X Draft (2013), (Asset Management Council Ltd, 2011). Using the tree metaphor, this section outlines the roots (tangible elements like systems, structure, communication and reward systems), the trunk (people, assets, leadership) and the branches (the processes and functions of the asset management systems).

#### 1.1.1 Definition of Asset Management and Assets

The Asset Management Council defines Asset Management as “The life cycle management of physical assets to achieve the stated outputs of the enterprise”.

***Gary Winsor, Operations Investment Manager, with more than 30 years experience in transport, power and energy sectors on Asset Lifecycles.***

*Asset management is about making sure that you understand the risk and the investment needed to operate the asset. It's about understanding when you need to change from operating to replacing and doing so in an appropriate timeframe, so that the long-run cost of ownership is low and doesn't represent an unnecessary burden on the asset owners or communities.*

One of the purposes of this definition is to define the boundaries of Asset Management and to differentiate it from other key management processes. The definition specifies a focus upon the delivery of a stated capability, in which assets play a key role and in which the business must manage the life cycle of its physical assets commensurate with the business need for that capability. Thus, the definition is concerned with short, medium and long-term considerations.

An asset is an item or thing that has potential or actual value to an organisation. The value will vary between different organisations and their stakeholders and can be tangible or intangible, financial or non-financial. Asset management is concerned with all aspects of capability from the conception of the need for an asset through its complete operating life to the final disposal (ISO 55000 Draft (2013)).

### **1.1.2 Fundamentals of Asset Management**

Asset management is founded on a set of fundamental beliefs. If any one of these fundamentals or principles is missing from the management of assets, the organisation will likely see a reduction in the value that its assets provide. The fundamentals should directly influence an organisation's asset management systems and plans.

These 'fundamentals' are discussed below.

#### *1.1.2.1 Value*

Asset management does not focus on the asset itself, but what the asset can do for the organisation and its stakeholders, that is, what value it can provide. Assets can deliver tangible and intangible, financial and non-financial value.

To determine an asset's value, a management system for the management of assets (the asset management system) employs decision-making processes that incorporate stakeholder determined criteria.

Through this management system, asset management plans can be developed and implemented that achieve the required asset performance and hence deliver the value to the organisation.

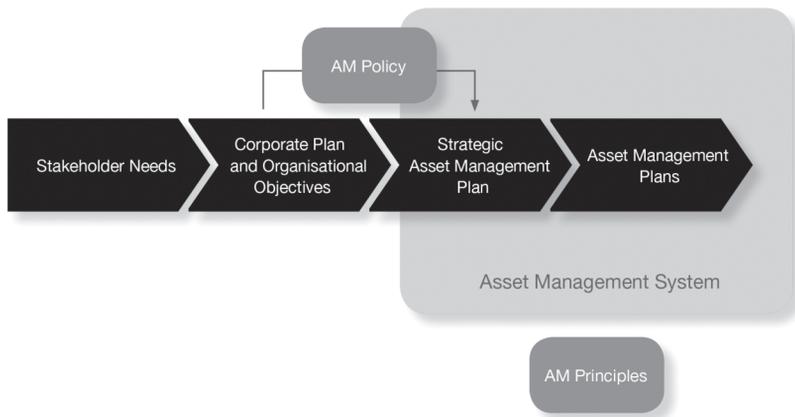
#### *1.1.2.2 Alignment*

Implementing an asset management system enables the organisation to translate organisational objectives into technical and financial processes, plans, activities and tasks, by applying a systematic and systemic approach to decision-making.

This fundamental is focussed upon the achievement of organisational objectives and goals by planning, specifying, designing and implementing a system to manage assets. This system also should meet relevant company, industry and regulatory technical and financial standards.

The asset management system supports competent employees make timely and accurate decisions by providing a transparent, traceable and logical link between decisions, activities and tasks of employees to the organisational objectives.

Figure 1.1 below shows the linkages and alignment between stakeholder needs to the asset management system and the subsequent asset management plans. It is this alignment that enables asset management to transform strategic intent and desired outcomes into plans, activities and tasks aligned to the achievement of organisational objectives.



**Figure 1.1: Organisational alignment between the stakeholder needs and the Asset Management System Requirements.**

### 1.1.2.3 Assurance

The need for assurance arises from the need to effectively govern an organisation. Assurance applies to assets, asset management and the asset management system. Stakeholders require surety that assets and the associated management system can and will deliver what is required of them.

To achieve this surety, senior management regularly reviews the processes that link organisational objectives to the required business functions and the performance of both the asset management system and the assets.

The continual improvement of both the asset management system and the performance of assets is part of the assurance function. This acts to continually assure stakeholders that the assets will meet requirements.

### 1.1.2.4 Leadership

Leadership and commitment from all levels of management is essential for successfully establishing, operating and improving asset management within the organisation.

The leadership style of an organisation should support both the achievement of organisational objectives and the relationship to the actions of employees. For asset management to be successful, employees should understand these objectives, and their role in achieving them. Such commitment should ideally come from all levels of the organisation.

Regular consultation with employees and service providers about changes or improvements to the asset management system is important as employees must be competent in completing their responsibilities, whilst working toward the collective organisational outcomes and goals.

### 1.1.3 Asset Management System

An asset management system is used to direct, coordinate and control asset management activities. It provides improved risk control and assures the achievement of asset management objectives on a consistent basis. However, not all asset management activities can be formalised through an asset management system; for example, aspects such as leadership, culture, motivation, etc are not managed through the asset management system, but they have significant influence on the achievement of asset management objectives. The elements of the asset management system should be viewed as a set of tools, which includes: policies, plans, business processes and information systems, which are integrated to enable an assured delivery of asset management activities.

### 1.1.4 Strategic Asset Management Plan

The strategic asset management plan can enable an organisation to create a link, if needed, between its asset management system (such as described by the ISO 5500X suite of International Standards) and a variety of specific, technical asset management requirements. These specific, technical requirements are given in standards both within and outside of the ISO environment, and at the international, regional or national standardisation levels; such standards provide information on strategies and tactics, as well as specific design, construction, material or process requirements.

***Andrew Morgan, Director in a consulting firm with over 25 years' experience in mining and asset management, on AM Imperatives.***

*The driving factors at a very high level, like safety, cost and business market share are usually the same across the board. The imperatives within each business, on the other hand, can be quite different. It's important to understand those differences because you then see that each sector and each type of business can be quite good at some areas that are critical to them, but other areas which are maybe not so critical, they're not necessarily as good.*

The organisational objectives provide the overarching context and direction to the organisation's activities, including its asset management activities. The organisational objectives are generally produced from the organisation's strategic level planning activities and are documented in an organisational plan (this plan may be referred to by other names, for example "the corporate plan").

### 1.1.5 Asset Management Plan

The organisation should also use its strategic asset management plan to guide its asset management system in the development of its asset

management plans (i.e. in setting “what” to do). The asset management plans themselves should define the activities to be undertaken on assets, and should have specific and measurable objectives (e.g. timeframes and the resources to be used). These objectives can provide the opportunity for alignment of operating plans with the organisational plan and any unit level business plans.

### 1.1.6 Asset Management Maturity

Asset management maturity is defined in this book as “The ability of an organisation to foresee and respond to its environment through the management of its assets, while continuing to meet the needs of its stakeholders’.

Asset management maturity requires that the organisation delivers outcomes such as customer service, profit, safety and assurance, with the assigned resources and within the requisite delivery period. Asset management maturity is dynamic and should be able to respond to both the changing business environment and changing stakeholder needs in a manner that aligns with the other functions of the organisation.

Asset management maturity can be considered as the extent to which asset management is aligned and integrated into the organisation. A discussion on asset management maturity may be found in Chapter 7.

## 1.2 The Need for Leadership and Workplace Culture

There are many standards that focus on the technical, tangible side of asset management alone. For example, the ISO 5500X asset management standard suite is to be published worldwide, is practically globalised and is written in English and French, and is applicable to all countries, however, it does not include any advice or recommendations with respect to:

- Behaviour and cultural aspects; nor
- Questions of leadership and culture; nor
- Asset management maturity and excellence.

Leadership, culture and maturity will provide the difference between high performing organisations and those that are not, when this management

**Peter Kohler, Director and Asset Management Strategist with over 30 years of experience in the rail industry and defence on Leadership.**

*A general observation from my many years of looking at asset management organisations, which goes back to the late '90s now, is that you can't undersell the notion of good leadership. Good leadership is not about someone directing everyone in a 'what to do and how to do it' fashion. It's essentially about creating the right environment, where people have a shared vision and understand their role in the development of that vision. The culture has to be a sharing, challenging one, meaning that new ideas are sought after, and indeed cherished. The combination of leadership and culture is, from my experience, certainly one of the key aspects of getting asset management right.*

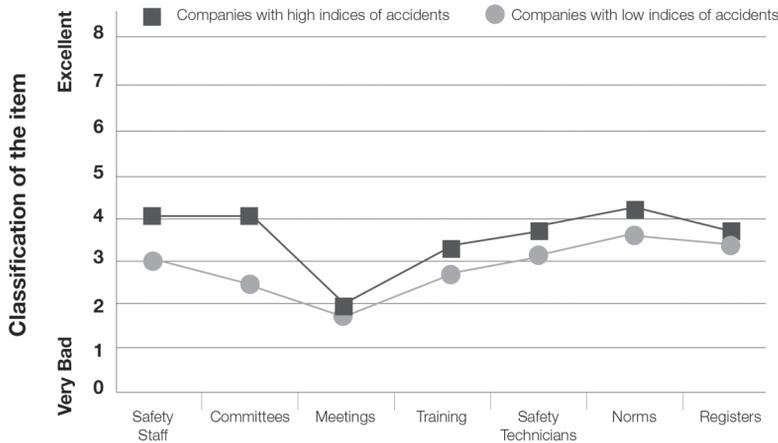
system standard is implemented. Leadership and culture can facilitate or impede the implementation of this paradigm to the asset management system.

Our goal in this book is to treat these aspects – emotions, behaviour, culture and leadership, along with the other elements of the Asset Management Maturity Model – that cannot be addressed in a universal manner such as in ISO5500X suite, thereby giving a greater insight in dealing with complex human factors affecting organisational performance. This cannot be done in a standard, because these issues are much broader and are always outside the scope of any management system standard.

It is the interaction of the tangible and intangible aspects of an organisation that can produce asset management maturity and excellence. Traditional tangible changes, such as reliability, quality, safety and asset management manuals, alone are not as effective as a change in behaviour and culture.

Using safety as an example, in the 1970s, research conducted by the National Institute for Occupational Safety and Health (NIOSH) in the U.S. surveyed organisations with high, low and extremely low accident levels, to identify the main factors that significantly influenced the results of safety. The research clearly demonstrated that commonly prescribed safety practices such as safety committees, safety rules, accident investigation and analysis, and safety programs – essentially all kinds of traditional safety features – were evident both in organisations with good safety performance and those with low safety performance (Hansen, 1993).

The results indicated that the typical elements of traditional programs were not enough to ensure good safety performance (see Figure 1.2 (Hansen, 1993)).



**Figure 1.2: Correlation between elements and safety results.**

Despite all the efforts of organisations to solve technical problems, when seeking the root cause of the problems, emotions, behaviour, culture and leadership are found to contribute markedly.

This line of thinking has a solid foundation. According to Schaler:

*“In a manufacturing company, it is really the front line that has the authority to act in order to make decisions that will actually result in safety.”*

(Schaler et al, 1993).

Maher is another who shares this vision. He says that management involvement is critical to improving safety and that manuals and programs alone are not enough to achieve excellence:

*“Manuals are not the essence of the process, but the people, organisation and attitudes are. Without a change in attitude, that commitment to quality that can make safety ‘happen’ in the organisation, a manual is just another book on the shelf.”*

(Schaler et al, 1993).

Another advocate of this view is Sarkis. According to him, the administration of culture is the key to safety results:

*“Safety in the workplace is more a function of the organisational issues of culture and administration activities than safety activities and regulatory sanctions.”*

(Schaler et al, 1993).

All the authors quoted above agree that manuals and instructions are not enough, and that behaviour and culture are key. None of them however, suggests how to work with or change culture in order to solve these problems.

In a study conducted by the Australian School of Business,<sup>1</sup> profit margins of what were designated as ‘high performing workplaces’ were nearly three times higher than those designated as ‘low performing workplaces.’ Additionally, high performing workplaces were more efficient at converting input (e.g. the cost of assets, such as human capital) into outputs (such as revenue charged for services provided). High performing workplaces generated 12% more income than low performing workplaces. These high performing organisations also out performed on outputs for services and products (Boedker et al, 2011).

In this study, high performing workplaces were culturally characterised by “a set of values and shared beliefs where people welcome and seek to introduce change and innovation, where leaders care for their employees and foster collaboration and where there is an ambition to deliver results and focus on achieving goals”. High performing workplaces exhibit more than one cultural type and leadership style, but the message to take away from this study is that all high performing workplaces put concerted effort into creating and embodying the appropriate leadership and culture – based on organisational values – within their workplaces, in order to achieve their required outputs.

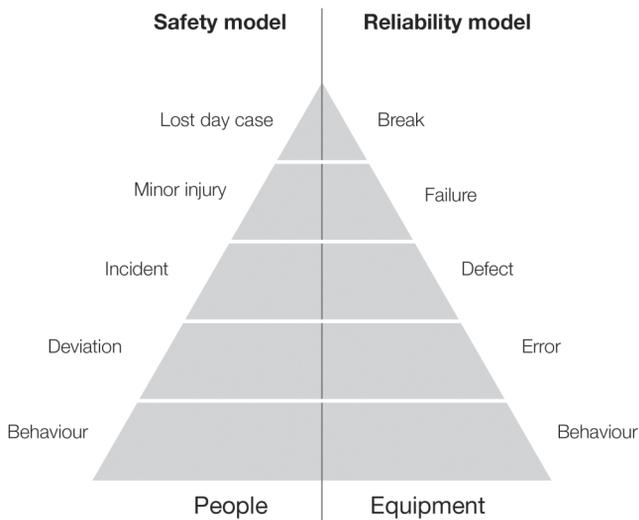
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<sup>1</sup> Conducted at the University of New South Wales, this study surveyed organisations primarily concerned with the provision of business services.

Comparatively, low performing workplaces had workplace leadership and culture characterised by control and stability rather than achieving outcomes and results.

It is important for the reader to note, that we are not claiming that technical and tangible issues are not important: they are. They are necessary conditions, but they are not fully sufficient to obtain the positive results in asset management that will produce high performing organisations. Likewise culture and leadership alone cannot produce results without the support of technical and tangible knowledge. It is the combination of both technical and tangible factors and leadership and cultural factors that is necessary for significant evolution in asset management maturity and excellence.

A crucial factor in achieving asset management excellence is behaviour. Asset management is inextricably linked to human behaviour.



**Figure 1.3: Frank Bird's accident causation model adapted from Bird (1980).**

Using Figure 1.3, derived from Frank Bird's accident causation model, a little more can be understood about the relationship between behaviour and asset management. According to Bird, for every major accident or lay-off, there are 10 minor injuries, 30 incidents, 600 physical deviations from procedure and 30,000 unsafe behaviours tolerated by the organisation (for example non-compliance with more mundane procedures, such as holding the handrail when using stairs or wearing a seat belt).

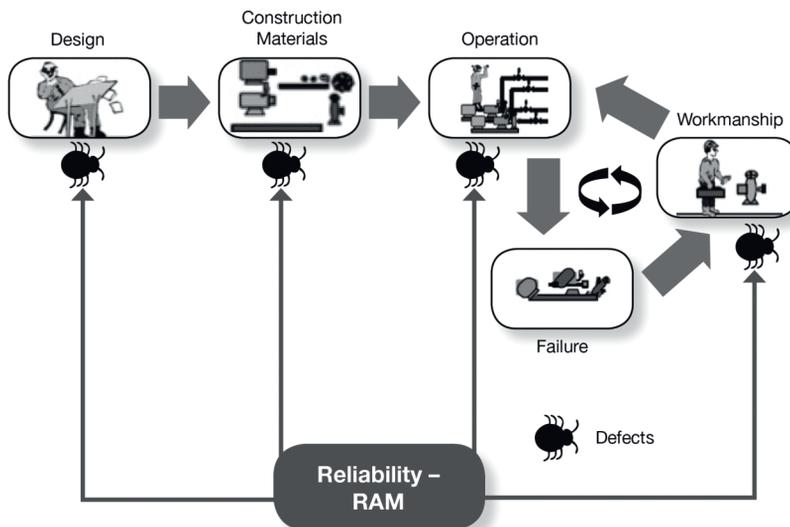
Applying Bird's model to reliability reveals a similar sequence. For every major breach of a piece equipment or an asset, there are 10 failures, 300 defects, 3,000 errors and 30,000 deviations in behaviour (Conocophilips, 2003). Figure 1.3 demonstrates how a system of operational excellence treats employee safety and equipment reliability in the same way.

According to the predictions of Bird's safety model, unsafe behaviour leads to deviations, which can lead to incidents, which may induce accidents without leave, and therefore

become accidents with sick leave.

The same happens with the asset performance and reliability version of the pyramid: deviations in behaviour leads to an error during the maintenance of a piece of equipment, which leads to a defect, to a failure, and ultimately, to a halt, which means loss of reliability and production. If behaviour is monitored and the equipment is well maintained, designed and operated, it is possible to prevent the error, and therefore failure. Over the last ten years it has been seen that extending maintenance periods and retraining maintenance staff resulted in a decrease in the failure rate. This produced increased reliability, improved asset performance and savings (Lafraia, 2002).

If emotion and behaviour is a base for culture (this will be covered extensively later in this book), then through appropriate leadership and culture, we can manage behaviour for excellence in asset management.



**Figure 1.4: Hands-on pencil (design, materials), tools (maintenance, construction), valves/buttons (operation) etc., hence the importance of behaviour to improve reliability.**

For the purpose of this book, asset management is a hands-on paradigm. The root cause of bad results is at the emotional and behavioural level of all asset management activities. As discussed above, safety and reliability issues all happen at the behaviour level. This concept can be applied to all asset life-cycle activities. A piece of equipment will be as reliable as the people planning, designing, supplying, operating and maintaining it.

The biggest challenge is how to translate, align and deploy asset management fundamentals, values, strategies and plans to the hands-on, shop floor staff doing the activities that produce the products and services (outputs) of the organisation. Using 'command and control' can make it happen, but at enormous cost and effort due to the lack of employee motivation and trust. Outcomes such as low cost, high production, quality, Safety, Health & Environment (SH&E), and reliability can only be achieved through high employee trust and motivation. These factors are intimately linked to

emotions, behaviour, culture and leadership within the organisation. Additionally, the reduction of 'command and control' is related to the ethical principle of creating an organisational environment that fosters education, learning and autonomy for all. This is an incredibly important message that needs to be read, repeatedly, in different contexts to be fully understood.

This book provides an overview of the foundations of asset management and then explores the impact that organisational design, leadership styles, process and procedures, emotions, behaviours and cultures can have on the organisations performance and the value delivered. These topics will be brought to life through real life examples from industry leaders in asset management, which can be found throughout the book. While the concepts outlined in the book are particularly intended for larger organisations managing physical assets, they may equally be applied to all types of organisations managing other asset types.

Asset management is a journey of delivering improved business performance. As the organisation matures continued improvements to financial performance, risk management and service levels will be evident.

## **A Journey from Unreliable to World-Class Asset, Part 1**

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This case study is based on an interview with Michael McGrath, General Manager and Change Agent with more than 40 years' experience in the manufacturing and process industries. It is presented in 8 parts throughout *Living Asset Management*.

### **Q: So what can asset management achieve, in your opinion?**

**A:** We took an asset that was of some billion dollars or more in value, that was very old and everyone said, "look it's a very old asset, that's just the way it is, old assets break down and no-one wants to spend money renewing them".

The competition for us was coming from overseas, from much bigger, more modern facilities, so we had to make a virtue out of taking an old asset (with a low depreciation cost) and making it perform to a world-class standard. It took seven years, but that asset went from being one of the worst performing facilities in the world to being world-class for its size and shape. In fact, one of the reasons why it still is in existence operating in Australia with a relatively small production base, is that it's able to compete with overseas facilities because it is small, it is efficient, it is highly reliable and most importantly it's highly predictable as to when it might break down. Its reliability numbers rank with the best in the world. Reliability went up, the costs per unit of production dropped by 50% over those several years, and its overall costs have reduced substantially.

This is because we had an integrated team focused on one set of business outcomes. Everybody was focused on the same outcome. Not on what was best for their function, but on what was best for the business outcome that we all wanted. We took small amounts of capital and invested it in key areas ... the key components that would make a substantial difference to performance.