

CONTROL YOUR ASSET LIFE CYCLE AT ANY STAGE.

Institution of
**MECHANICAL
ENGINEERS**

Improving your asset procurement, performance and profitability.



ASSET MANAGEMENT AND MAINTENANCE

The way that a company acquires its physical assets and then deploys them can have a massive effect upon the success, profitability and sustainability of the business.

Asset management is the management of physical assets throughout their life cycle in order to achieve the objectives of the business.

The asset life cycle is illustrated in the diagram below:



ASSET LIFE CYCLE

The first stage of the asset life cycle is acquisition which involves:

- Justifying the purchase of the asset
- Identifying its functional and operational requirements
- Developing a specification
- Selecting a supplier and procuring the asset
- Installation and commissioning

The second and third stages are somewhat extended and include most of the assets useful life. These are asset operation which involves:

- Developing and implementing operating methods and procedures
- Training and deploying operators
- Continuously improving processes
- Carrying out asset care activities
- Measuring and monitoring operational effectiveness

And asset maintenance which involves:

- Developing and carrying out planned maintenance tasks
- Monitoring the condition of the asset
- Taking corrective actions when required
- Fitting replacement parts when required
- Measuring and monitoring asset reliability and performance

The final stage of the asset life cycle is disposal which may be required due to:

- The asset reaching the end of its useful life
- The asset being superseded by new technology or processes
- The asset no longer being able to comply with regulatory or statutory requirements

The disposal stage can be delayed if it decided that major refurbishment or upgrade of the asset is cost effective.



MEET THE TRAINER: MATTHEW LASKAJ

Matthew is the Chair for the Institution of Mechanical Engineers Scottish Region and director of a successful engineering consultancy.

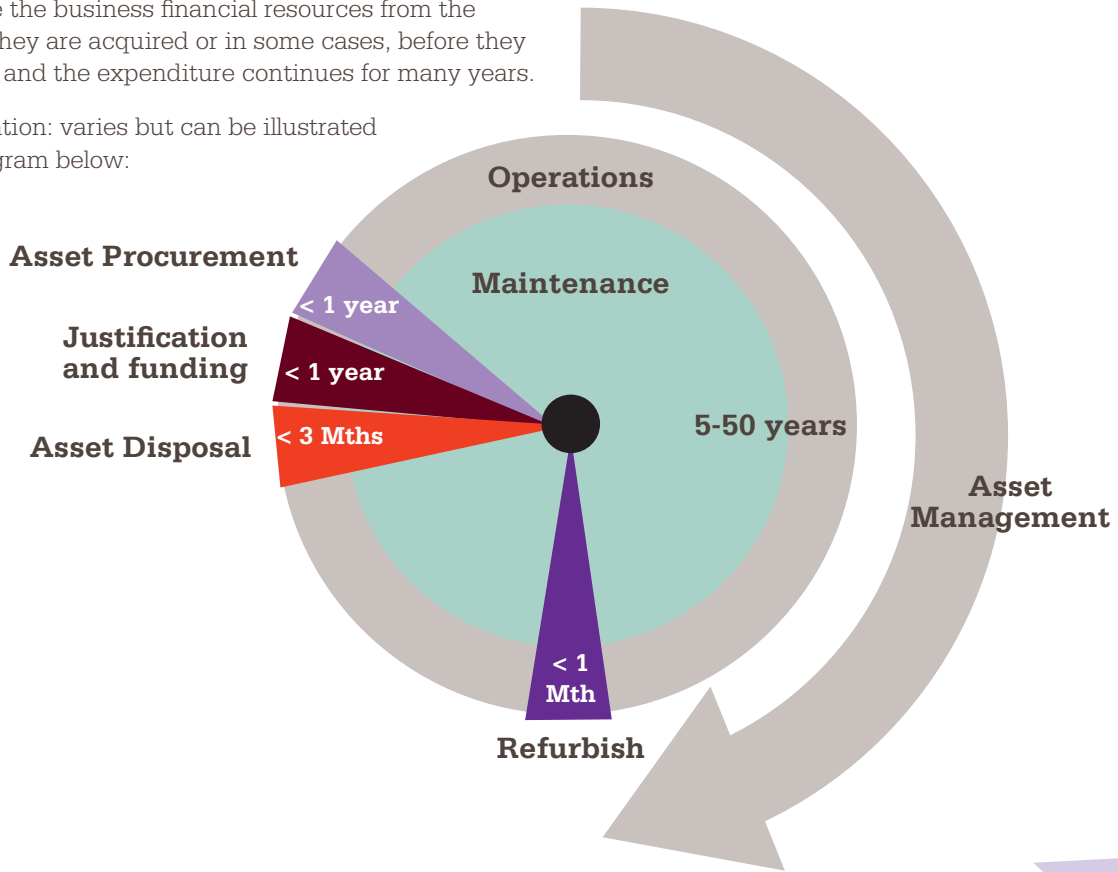
Starting his career in Australia Matthew worked in manufacturing plants, refineries and offshore oil rigs, he now lives in Aberdeen and loves to help engineers develop their skills and improve their business.

Asset management is concerned with all of these stages of the life cycle of company assets.

Industrial businesses often highly utilise their assets, many of which are critical to their operations and are employed over an extended period of time.

They consume the business financial resources from the moment that they are acquired or in some cases, before they are purchased and the expenditure continues for many years.

Life cycle duration: varies but can be illustrated as per the diagram below:



WHAT IS ISO 55000 AND HOW DOES THIS FIT WITH ASSET MANAGEMENT?

ISO 55000 is the international standard for the management of physical assets throughout their whole life cycle.

Businesses that apply best practice asset management, as defined by the standard, will ensure that they achieve the best financial return on assets (ROA) and return on capital employed (ROCE) by ensuring that assets acquired, deployed, operated and maintained by the company support the objectives of the business by providing the levels of performance, reliability and operating costs required.

By achieving ISO 55000 accreditation, an organisation demonstrates to its shareholders, stakeholders and customers that it acquired, deploys, operates and maintains its physical assets professionally and effectively.

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HOW OUR MAINTENANCE MANAGEMENT PROGRAMME ADDRESSES THE NEEDS OF ASSET MANAGEMENT AND MAINTENANCE AT EVERY STAGE OF THE ASSET LIFE CYCLE.

STAGE 1

PROBLEM:
I NEED TO UNDERSTAND HOW TO MANAGE THE PHYSICAL ASSETS OF MY BUSINESS.

SOLUTION:
ASSET MANAGEMENT - OPTIMISING MANUFACTURING ASSETS

WHY DO WE NEED IT?

Many companies suffer from the poor reliability and performance of operational machinery and equipment along with results of poor capital investments.

This manifests itself as excessive amounts of planned and particularly, unplanned downtime, insufficient operational capacity and output rates, poor levels of compliance and poor utilisation of resources as well as rapidly depreciating asset value and poor returns.

This also leads to excessive operating costs and low employee morale and contributes substantially to poor business performance and profitability and low rates of return on capital employed.

The benefits of the application of asset management practices and systems include:

- The development of an effective strategy and implementation plan, objectives and structure supporting the business plan
- The development and implementation of effective processes for the management of assets within the business
- Improved return on capital employed for physical assets and reduced life cycle costs
- Improved equipment acquisition processes leading to shorter purchasing and installation times and faster ramp up to operational effectiveness
- Better capital and operational expenditure planning and cost control leading to reduced overall operational and maintenance costs
- More effective planning and deployment of maintenance resources and targeted efforts leading to maintenance cost/capital asset value ratios of less than 2%
- Full compliance to relevant regulatory and statutory standards and requirements

STAGE 2

PROBLEM:
I MUST ENSURE THAT THE VERY BEST ASSETS ARE ACQUIRED TO MEET THE NEEDS OF THE BUSINESS AND MAXIMISE PROFIT.

SOLUTION:
EARLY EQUIPMENT MANAGEMENT

WHY DO WE NEED IT?

The purchase of any new machinery and equipment involves a degree of risk to the business as it often represents a significant investment that requires a reasonable return.

Ensuring that the investment is value for money requires an assurance that the asset is fit for purpose and will operate effectively throughout its life time with minimum operational and maintenance costs.

It is very important that lessons learnt from the operation and maintenance of existing assets are applied to any new assets so that increased levels of reliability and performance can be achieved.

The benefits of the application of early equipment management principles and practices include:

- The development and deployment of an effective capital equipment acquisition process to suit the needs of the business
- The development and application of a robust methodology for equipment procurement that ensures operational lessons are learned and applied to new acquisitions
- Improved financial return on capital employed for machinery and equipment assets and reduced life cycle costs
- Increased engagement of production and maintenance personnel with the asset life cycle, particularly with acquisition and operation
- The achievement of shorter project time scales including more rapid commissioning, hand over and ramp up to operational levels of performance
- The acquisition of assets that incorporate operator and maintenance 'friendly' features leading to lower operating costs
- Increased control and knowledge of asset performance, reliability, costs and operational issues throughout their life cycle

STAGE 3

PROBLEM:

I NEED TO APPLY THE VERY BEST MAINTENANCE APPROACHES, TOOLS AND TECHNIQUES TO ENSURE THAT MY ASSETS ARE RELIABLE AND PERFORM WELL.

SOLUTION:

WORLD CLASS MAINTENANCE

WHY DO WE NEED IT?

Many companies suffer from poor reliability and performance of manufacturing machinery and equipment.

This manifests itself as excessive amounts of planned and particularly, unplanned downtime, insufficient production capacity and output rates, poor levels of compliance and poor utilisation of resources.

This also leads to a reactive operating environment, excessive operating costs, poor delivery performance and low employee morale and contributes substantially to poor business performance and profitability.

The benefits of the application of world class maintenance principles and practices include:

- Improved asset reliability and availability leading to higher levels of capacity, productivity and profitability
- The development and deployment of robust processes enabling effective, proactive maintenance to be achieved
- The development and implementation of the most appropriate organisational structure that supports maintenance processes and particularly promotes pro-active maintenance practices
- The development of a well trained, flexible and motivated work force with objectives aligned with the needs of the business
- Improved planning and utilisation of maintenance resources yielding maintenance cost reductions (typically 20-30% over 2-3 years)
- Improved levels of regulatory and statutory compliance
- The achievement of world class reliability and maintenance including less than 20% unplanned maintenance, more than 80% of maintenance hours planned and less than 5% emergency maintenance

STAGE 4

PROBLEM:

I NEED TO ENSURE THAT MY MAINTENANCE PLANS AND RESOURCES ARE EMPLOYED EFFECTIVELY, MAINTAINING MY ASSETS IN THE MOST COST EFFECTIVE WAY AND REDUCING BUSINESS RISKS.

SOLUTION:

RCM AND RISK BASED MAINTENANCE

WHY DO WE NEED IT?

Methods that can be used to investigate and appraise asset condition are always evolving and organisations do not invest in new technologies and tools to optimise maintenance resources, costs and the risks associated.

This can lead to misleading measures and poorly examined assets, which in turn disturbs reliability and maintenance performance.

The benefits of the application of risk based maintenance principles and practices include:

- More effective maintenance life plans leading to the better and more targeted utilisation of maintenance resources, reduced spares and materials costs and inventory levels
- Reduced levels of operational and maintenance risk to the business
- Improved machinery and equipment reliability and operational availability leading to lower levels of reactive maintenance (typically <5%)
- Improved processes for the review and management of change for maintenance plans and machinery improvements
- Maintenance effectiveness improvements typically leading to maintenance cost reductions of 20-30%.
- The most effective application of reliability and maintenance tools and techniques leading to world class levels of plant and machinery performance at optimum cost

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STAGE 5

PROBLEM:

I NEED TO BRING ABOUT A CULTURE CHANGE IN MY BUSINESS IN ORDER TO IMPLEMENT, ACHIEVE AND SUSTAIN ALL ASPECTS OF WORLD CLASS ASSET MANAGEMENT AND MAINTENANCE. I ALSO NEED TO ENGAGE AND INVOLVE OPERATIONS AND ENGINEERING WITH THE CARE AND CONTINUOUS IMPROVEMENT OF ALL ASSETS.

SOLUTION:

TOTAL PRODUCTIVE MAINTENANCE

WHY DO WE NEED IT?

There is an increasing requirement for reliable and capable machinery and equipment with high levels of availability and performance.

There is a requirement to optimise the life cycle costs of manufacturing assets supported by cost-effective maintenance processes.

It is essential to gain the engagement and involvement of operations personnel with machinery maintenance and continuous improvements within their area.

There is the need for a structured and well managed approach to machinery acquisition, maintenance and on-going improvements.

The benefits of the application of TPM principles and practices include:

- Full engagement of the work force at all levels with asset care and asset improvement
- Identification and elimination of the major operational losses and their measurement through overall equipment effectiveness (OEE)
- The development of a continuous improvement culture on site
- The development and deployment of an organisational structure that is aligned to the needs of the business and promotes TPM effectiveness
- Improved involvement of production operatives with the care and improvement of their operational assets
- The implementation of lean principles to manufacturing and maintenance processes
- The development of 5 disciplines and practices within the work place
- Reduction of manufacturing and maintenance costs through the deployment of TPM practices throughout the organisation

BUSINESS VALUE, BENEFITS AND DELIVERABLES – CASE STUDIES

Whilst names and companies have been anonymised, these case studies are based on real examples of how Maintenance Management has improved cultural change, performance and profitability.

IMPROVING PERFORMANCE AND MAXIMISING BUDGET

A pharmaceutical manufacturing site embarked upon a world class reliability and maintenance programme. As a result the maintenance budget was reduced by £800k whilst world class levels of performance were achieved. This included 100% compliance and <3% unplanned maintenance work.

IMPROVING EFFICIENCY WHILE REDUCING MAINTENANCE

A food manufacturing site introduced and implemented an asset management improvement programme over a period of 3 years. Although during this period output increased by 40%, maintenance budgets stayed the same and the levels of unplanned maintenance work reduced from 90% to 20% of technician time.

REDUCING DOWNTIME AND SAVING MILLIONS

A chemical manufacturing site embarked upon a maintenance improvement programme to address high levels of downtime which massively affected output. Within 1 year the amount of lost time due to reliability issues was reduced by 60% leading to a saving of >£1m.

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WHICH COURSE IS RIGHT FOR YOU?

The Maintenance management programme has been created to deliver a variety of effective methods and tools to equip your organisation in every stage of the Asset Life Cycle. Below are some related organisational positions that we have found benefit the most from each course. There are including but not limited to:



Creating a complete programme to improve your organisations performance and profitability incorporates the engagement and involvement of the work force at all levels.

For guidance on which course would suit your requirements call our experienced training advisors on **+44(0)207 304 6907** or email **training@imeche.org**.

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