

**This is a sample of the PowerPoint
on Industrial Reliability and
Maintenance Management, available
at [http://www.bin95.com/PPT-
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Bill Masters Reliability and Maintenance Management

Travel 'the Journey' to Reliability and Maintenance Management Mastery

Part 2 – Maintenance Management: Profit Centred Maintenance

Presented by Mike Sondalini



Hello, and welcome to the second of our PowerPoint presentations to help you to understand and master plant and equipment reliability and maintenance management.

Most people think maintenance is involved with looking after machinery and infrastructure. But the truth is maintenance is about building more reliable and productive businesses. Maintenance is best managed from the perspective of how to use maintenance to maximise the profits of a business. Seen from this light, maintenance becomes a profit centre, that makes its money by the amount of savings and additional revenue it brings to the business.

Bill talks to Walter about the future...

Hi Walt, can I get a few minutes today in your busy CEO schedule to talk to you?

Hello Bill, in fact do you want to talk now?

Yes, now is good. Last week I meet Professor Miles, a reliability expert at the university, and discussed what we need to do to improve our operating plant performance. He convinced me to refocus our strategies toward what he called 'plant wellness and equipment health'.

I've never heard of wellness and health applied to machinery. Is it the same as human well-being?

Pretty much. The professor convinced me that we need to make machinery well-being the maintenance department's primary objective. And as a consequence production performance naturally improves because the equipment is available to run at full capacity.

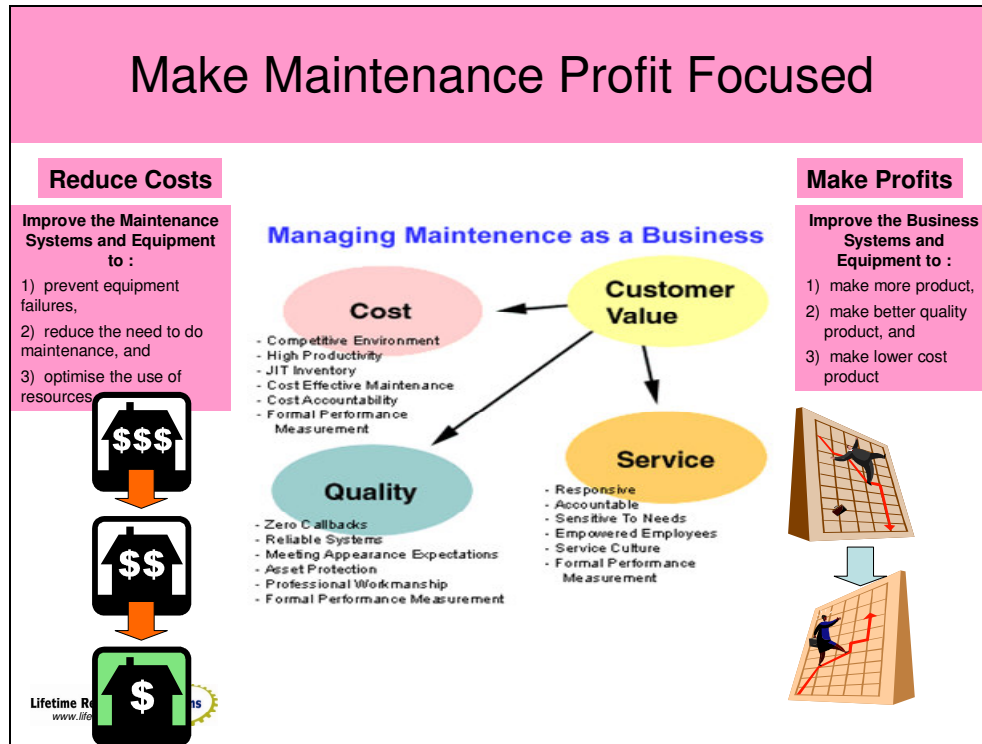
I can see the sense of that. Is that why you want to see me?

I want to develop a proposal for a new way to run the maintenance department so it brings more profit to the operation. It'll take a few weeks to detail, but I believe it will bring great benefits.

You have me enthralled Bill. Your timing is perfect, there is a Board meeting in a month's time at which I wanted to present the members with a plan to revitalise the operation. What you are doing is just what we need. Please get your plan to me the week before the Board meeting.

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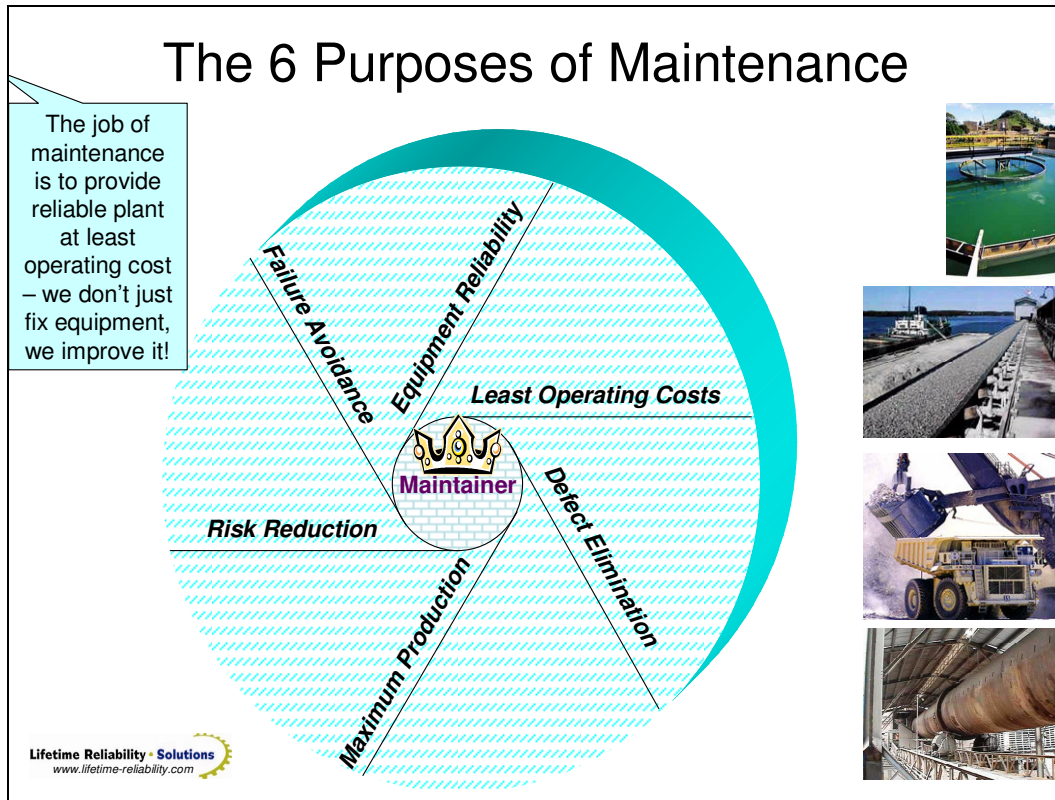


Maintenance can become a profit centre (instead of a cost centre) when its prime purpose is to either save money or make money. The best is to have it do both concurrently.

Maintenance saves money by 1) preventing plant and equipment failures, 2) by reducing the need to do maintenance and 3) by optimising the resources (i.e. finding the lowest cost mix between in-house staff and contractors) needed to maintain the operation.

It makes money by improving plant and equipment so that 1) it can make more product, 2) it can make better quality product or, 3) it makes lower cost product.

When Maintenance (i.e. its people and resources) is used to get more performance from existing plant and equipment it becomes a profit-focused business. The key issue is to turn Maintenance into being profit-driven in its thinking and practices.



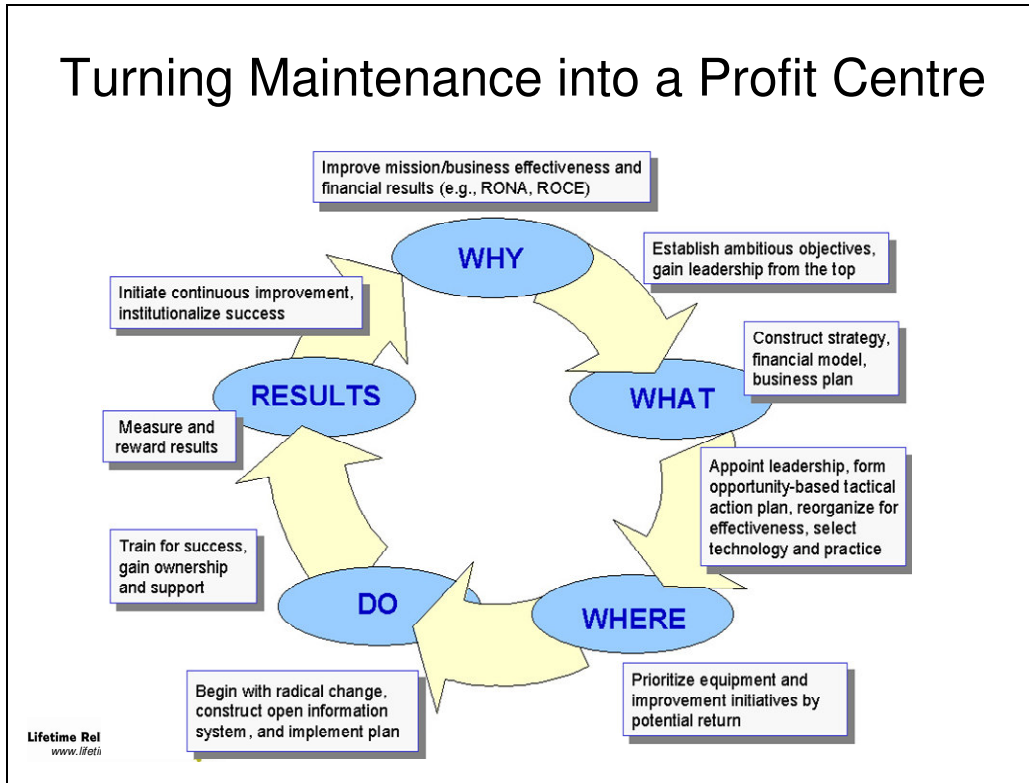
Maintenance has a greater purpose than simply looking after plant and machinery. If that was all that was necessary then maintainers would only ever fix equipment and do servicing. In today's competitive world, maintenance has grown into the need to manage plant and equipment over the operating life of a business' asset. It is seen as a subset of Asset Management, which is the management of physical assets over the whole life cycle to optimize operating profit.

There are at least six key factors required of maintenance to achieve its purpose of helping to get optimal operating performance. These are to reduce operating risk, avoid plant failures, provide reliable equipment, achieve least operating costs, eliminate defects in operating plant and maximise production.

In order to achieve these all people in engineering, operations and maintenance need great discipline, integration and cooperation. There needs to be an active

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partnership of equals between these three groups where the needs and concerns of each is listened to and



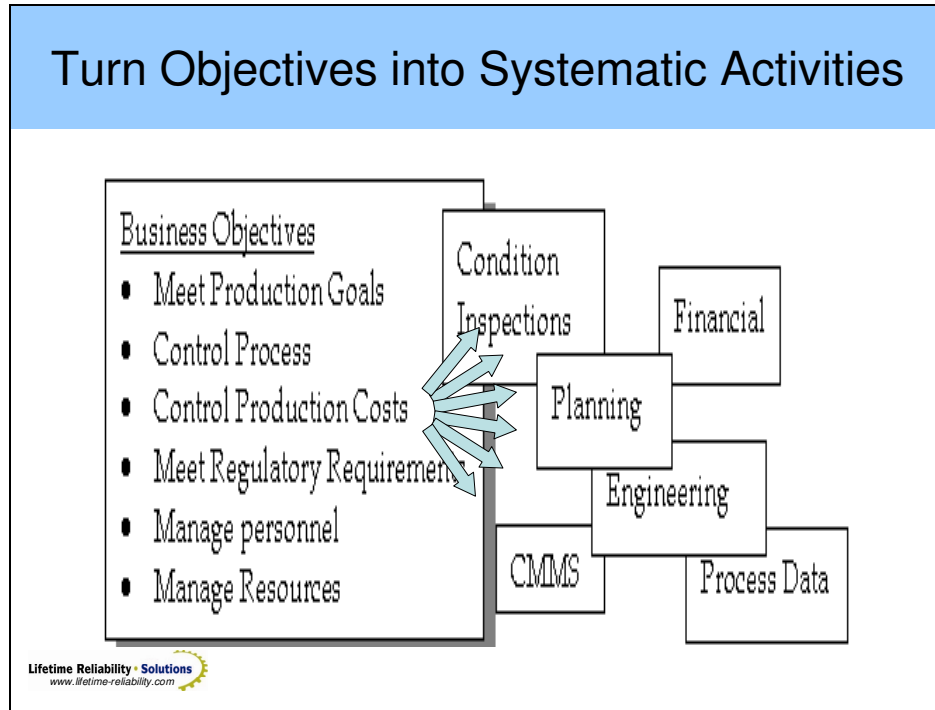
Maintenance can be refocused toward improving the 'bottom line' by developing a new model for the 'business of maintenance'. To do this successfully the change must be soundly led, well-planned and properly resourced, then communicated to all and persevered with until it becomes the standard way that maintenance contributes to the organisation's success.

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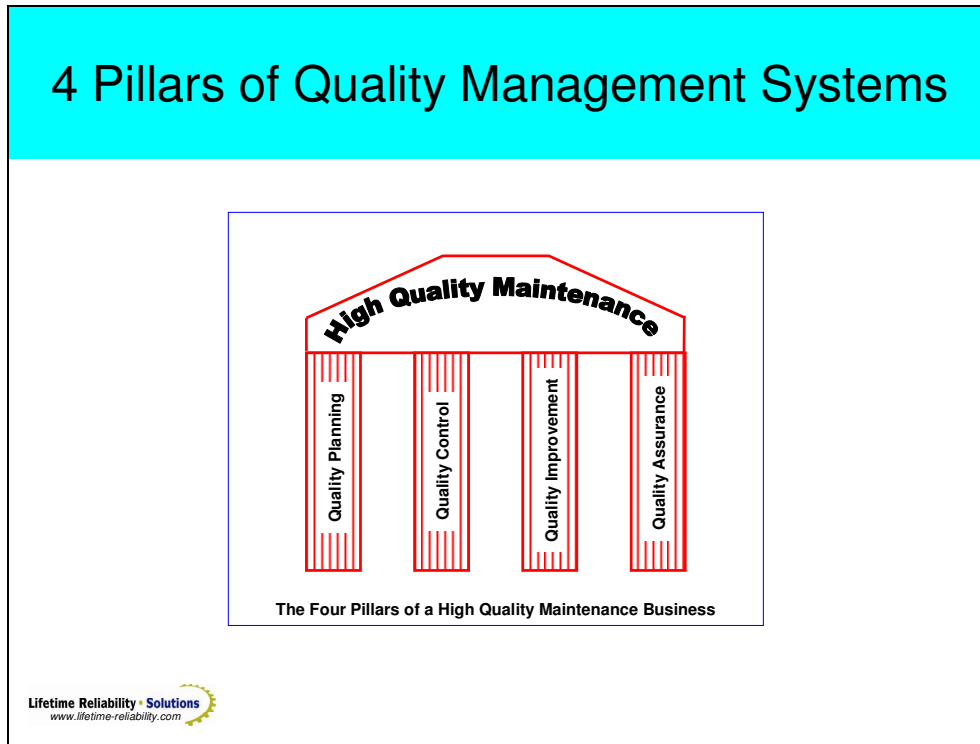
Develop a Plan to Reach Mastery

The Journey to Reliability and Maintenance Mastery										
	Leadership and Capability					Systems and Processes				
	Maintenance Vision & Strategy	Performance Measures	Organization Structure	Human Resources	Knowledge Base	Maintenance Strategy	Materials Management	Planning & Scheduling	Contractor Management	Reliability Engineering
Mastery	Quality System managed Accrual/Controlled Enterprise where everyone in every department works to 31 error free 100 processes. Lean philosophies improve processes	Bestest strategy tools: Maintaining Life Cycle Profit, Defect And Failure Tree, (DFT) Cost database	Integrated cross-national teams incorporating financial, engineering, operations and maintenance	Empowered, flexible, cross-national teams of people working to solve discipline	Continually learning, pushing-out-the-frontiers of human knowledge and understanding. Six Sigma discipline is normal	Domain driven all engineering, inspection, operations and maintenance work. Risk analysis and management normal	More risk problems designed-out, OEM involves real-time information on critical parts' condition and carries necessary spares	Reducing as much as possible as extra time between outages; costually reducing time to repair with Lean philosophies	Small teams of experts sending extra local expertise out to the maintenance and design-out maintenance with profit sharing	Design and Operations Cost Tools optimized for Risk (DOCTOR) is used to minimize all operating risks to protect the facility life
Excellence	Personnel action plans; apparatus are clearly tied to the maintenance strategy	On-going benchmarking of metrics and processes; Full cost database	Total Productive Maintenance where operators drive reliability, condition and maintenance equipment root cause failure analysis by operators and maintainers	Empowered, flexible, world-class workers; self-managed teams	Experts systems used; fully integrated CMMS common database	Preventive & Predictive plans come to rely optimized, the "right" maintenance tasks is applied based on analysis	Stores system integrated to CMMS and accounting system; bar coding or radio frequency tags or all stores; Word-class Stores Management	>90% all maintenance is planned and >95% failures resolved; rolling schedule fixed for the week ahead	Small numbers of contractors on long term planning partnerships with high accountability	Risk and failure reduced to berth industry by analysis and modeling
Competence	Reliability based Maintenance programme that actions plan is linked to the maintenance Management Strategy	Statistical process control applied to maintenance processes; Equipment maintenance cost available	Established teams for achieving key objectives in the Maintenance Management Strategy	Multi-skilled trades with process capability analysis and task to operating skills	Easy access to knowledge bases available to all employees at all times	Preventive & Predictive plans exist for all maintainable items; emphasis on PDM. All trades understood	Single source supplier partnerships established and effective; Areas stores with all key tags; Reliability of spares maintained; Suppliers provide technical expertise	Long term asset planning established; Critical parts analyzed for all reliability and all reliability	Contractors are established based on principle of risk sharing; Contractors provide technical expertise	Effective Root Cause Analysis (RCA) applied to equipment problems to extend life
Understanding	A clear Maintenance action and strategy is documented and communicated to all employees	Up-11 - Output process measures reviewed and documented; Down-11 - Input process measures reviewed	Decentralized with central support. Clearly written maintenance roles for each maintenance function and group	Trade task problem identification and solving; team dynamics and training skills	Document control system established; CMMS installed and used to manage knowledge bases	Preventive & Predictive plans exist for key equipment; Compliance to scheduled plan is more than 95%	Spares classified with separate strategies; Spares linked to BOMs/Equipment drawings; Standardization policies exist; ABC spares management with 'A's spares protected	All but unexpected failures planned; Alpha and beta specifically ranked; labor, materials, tool, technical detail	All contractor repairing problems are capable of Original Equipment testing	Backlog equipment conditions established; Good failure databases; All major failures investigated; FIM modified based on site experience
Awareness	No clearly documented role of maintenance; No Maintenance action or strategy	Some downtime records; Maintenance cost regularly available, but not segregated into available	Centralized maintenance group with all in-house production; Team approach to technical problems	Trade task maintenance support (inspection, reporting) skills	Plant register established and used to track critical technical data; All drawings and equipment information available	System to identify all maintainable items exist; Emphasis on time-based overhaul and inspection	Stores catalogue established; Inventory control systems; Good planning under in-place	Work Request Order system; Alpha and beta ranked; six sigma fully planned and programmed	Contractors used for peak loads and non-core maintenance work	Correct failure data gathering initiated; Issues occur regularly reviewed for failure analysis
Innocence	The main role is to fix it when it breaks/breaks	Incomplete or no maintenance downtime records; Maintenance cost not readily available	Centralized maintenance group with all in-house production; Control approach	Trade task trade skills; In-house technical knowledge or supported training only	As-is records kept for production; No plant register or control drawings	Plant register not used; As-is drawings and inspectors only	As-is stores; No coding or control of spares	No planning done on-site; Short term focus	All maintenance carried out by in-house team, which may include individual contractors	No failure records

This table lists key elements in delivering a masterly performance of maintenance. The way to use it is to rate your operation as at present, and then identify the gaps between today's performance and the performance you want to have in future. By drawing the current level of performance on the table, this process provides you with a list of proactive actions to plan, prepare and introduce into the operation that will lift the maintenance contribution to the well-being of the business.



Once objectives for the 'business of maintenance' are decided, they need to be turned into plans, with tactics to achieve them, and then into actions to implement . You must remember that you are setting up a 'business' that will make maintenance profitable for the organisation and that requires a business mindset with appropriate business systems and methods.



Quality Planning

QP is setting quality objectives and specifying necessary operational processes and related resources to fulfil the quality objectives.

Two levels - Strategic - business goals and means to reach them
- Operational - product goals and means to reach them

Planning sequence:

Establish goals

Identify who is impacted by the goals

Determine needs of stakeholders relative to goals and goal priority.

Develop products and services with the features that respond to stakeholders needs.

Develop processes able to produce, promote and distribute the product features.

Establish process controls and transfer the plans to operations.

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QP output is a set of detailed instructions at every necessary level of the organisation to carry out the objective.

Elements of a Good Management System

- Derived from the Vision and Strategy of the organization
- Planning
 - Long term strategic plan
 - Short term business plan and budgets - tactical
- Measurement
 - Focused set of meaningful measures at each level that those being measured can influence
 - Measures represent cascaded organization's plan and vision
 - Mix of predictive and historic indicators
- Review and Improve
 - Plans regularly reviewed and suitably revised from workplace feedback
- Performance
 - Rewards are linked to driving key measures

All management systems contain basic elements that make them successful. This slide highlights the well-known ones which will need to be applied to a profit centred maintenance restructure.

What Are the Critical Success Factors?

Critical success factors affect the ability to achieve objectives, and include:

People

- Wide participation in development
- Ownership by all functions and management
- Understanding by each function of roles and contributions
- Crafts and operators understand and are measured on contribution

Measures

- Cascaded and aligned annual goals
- Lead and lag indicators
- Practical, useful, simple
- Improvement over time
- Clear benefits, with tracking and accountability

Process

- Sponsorship and visibility at highest level
- Organizational structure
- Accountability
- Integration with annual plan

An additional success factor is to follow a proven model for growth...

You will see a good management system when it is operating. It has evidence of successfully addressing the factors shown in the table. You will see its goals and objectives being achieved.

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