



ENGINEER ACADEMY

Certified Maintenance & Reliability Professional (CMRP) BOK Guidance Course –Pillar 1

Presented by

Dr. Motaz abdel salam mohamed

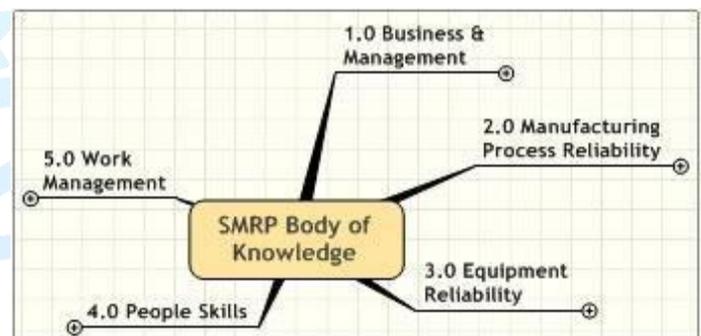


CMRP Pillars



ENGINEER ACADEMY

- Pillar 1 - Business and Management
- Pillar 2 - Manufacturing Process Reliability
- Pillar 3 - Equipment Reliability
- Pillar 4 - Leadership and Organization
- Pillar 5 - Work Management



Pillar 1 - Business and Management



Concept & strategy

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This subject area describes the skills used to translate an organization's business goals into appropriate maintenance and reliability goals that support and contribute to the organization's business results.

Profits



Pillar 1 - Business and Management



Concept & strategy : Introduction



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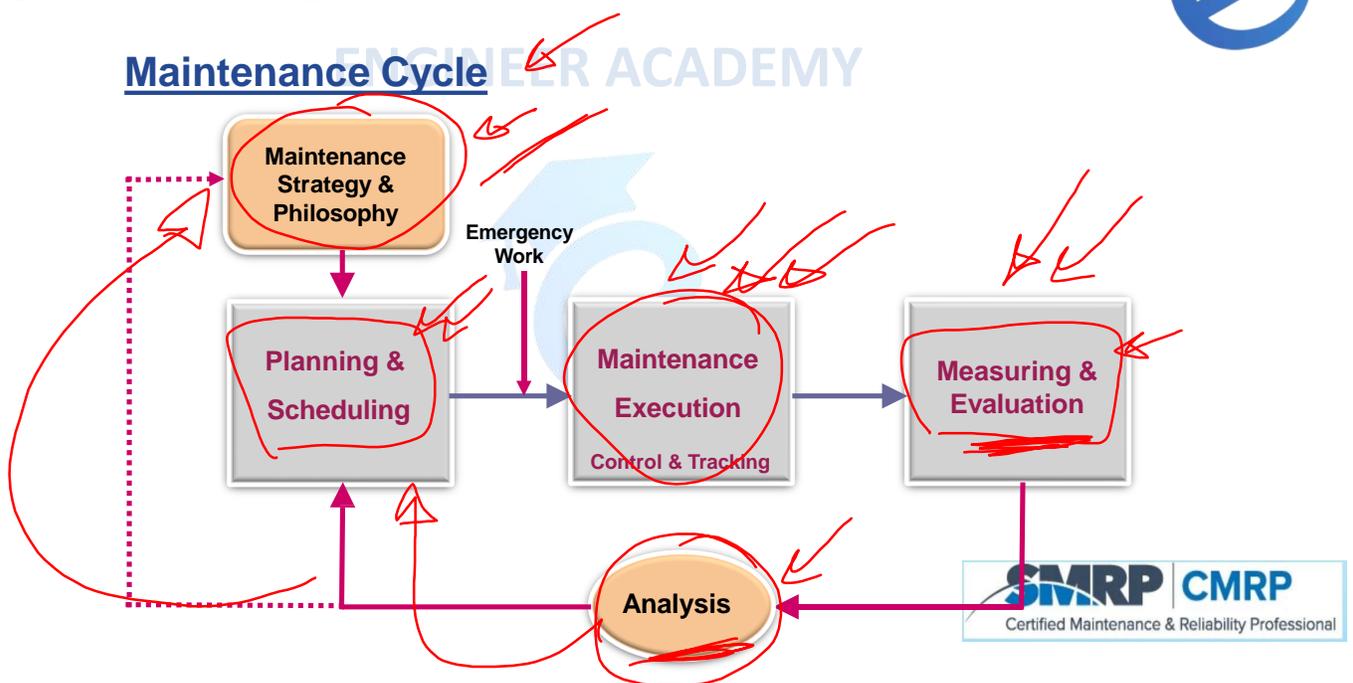
Concept & strategy : Introduction



Pillar 1 - Business and Management

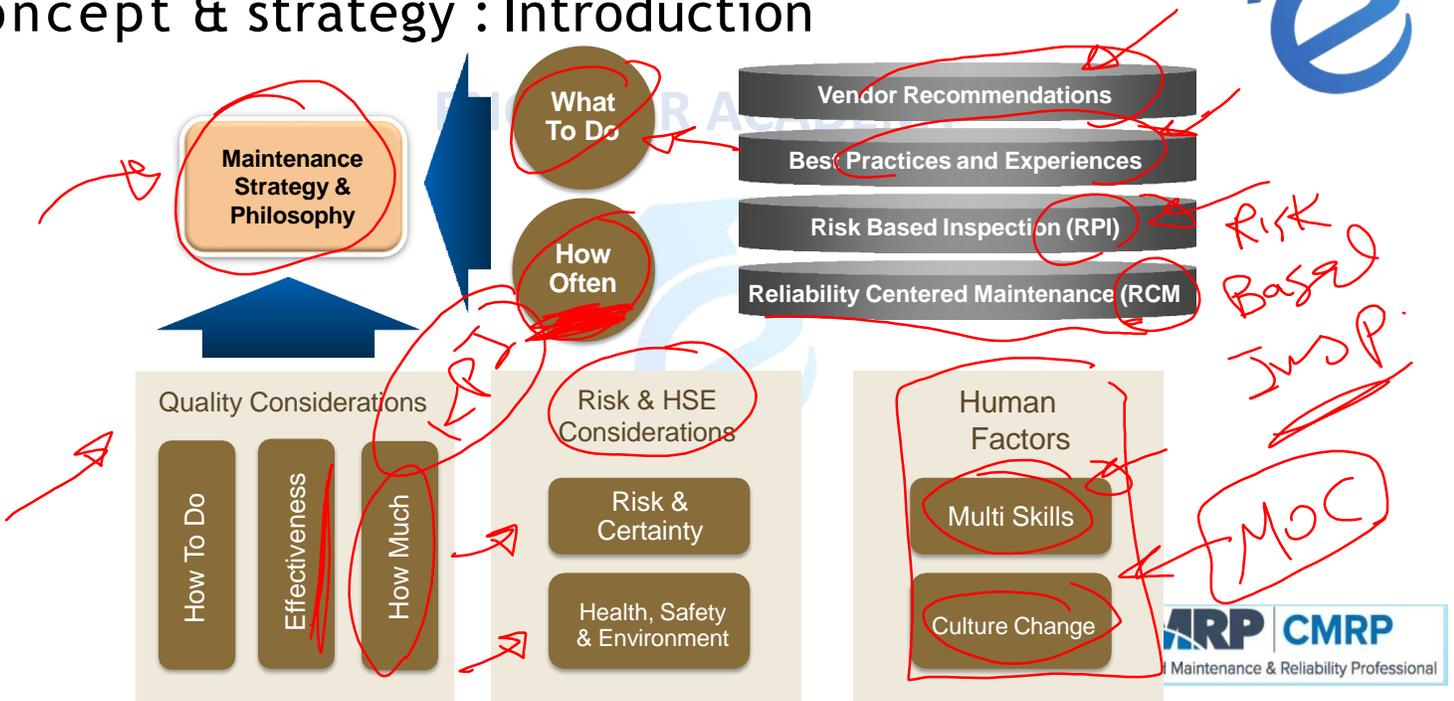


Concept & strategy : Introduction



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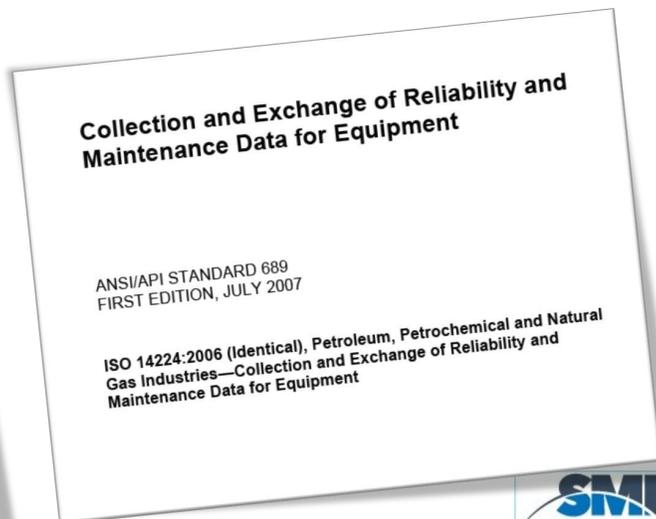
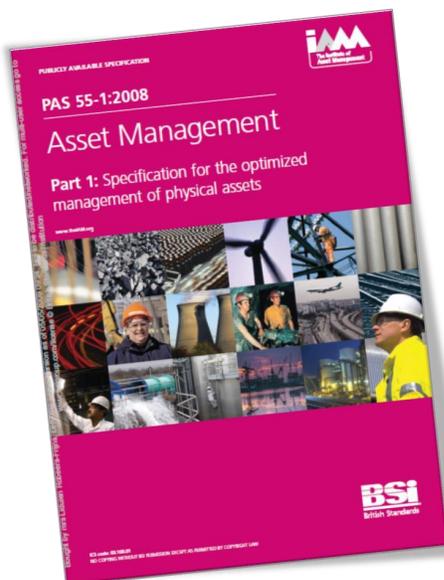
Concept & strategy : Introduction



Pillar 1 - Business and Management

Concept & strategy : Introduction

Maintenance & Asset Management Standardization :





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Concept & strategy : Introduction

Maintenance & Asset Management Standardization :

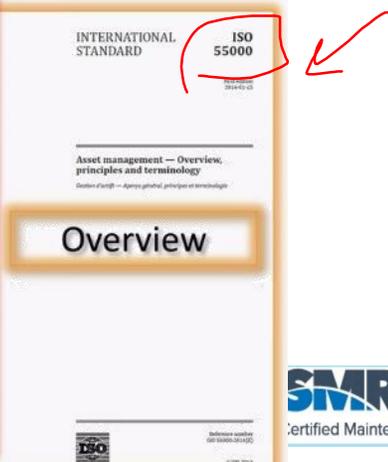
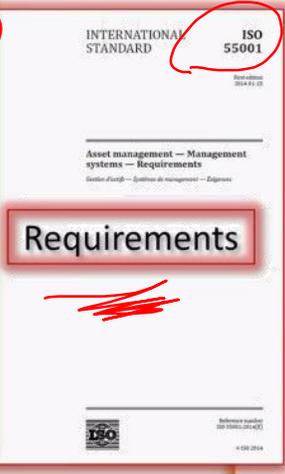
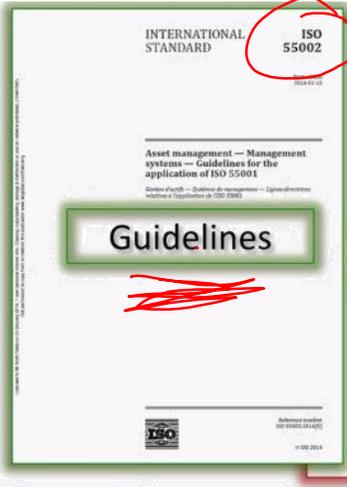


Pillar 1 - Business and Management

Concept & strategy : Introduction



ISO 55000, International Standard for:
Asset Management – Management System





Pillar 1 - Business and Management

Concept & strategy : Introduction

ISO 55000, International Standard for: Asset Management – Management System

- It doesn't tell how to manage assets or how to technically deliver the required value.
- Value will be delivered by decisions and processes that are made in correctly managing the asset management activities
- It focuses on "What to do" not on How to do it"
- It adopts a "Business centric" approach rather than an "Asset centric" view.



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Concept & strategy : Introduction

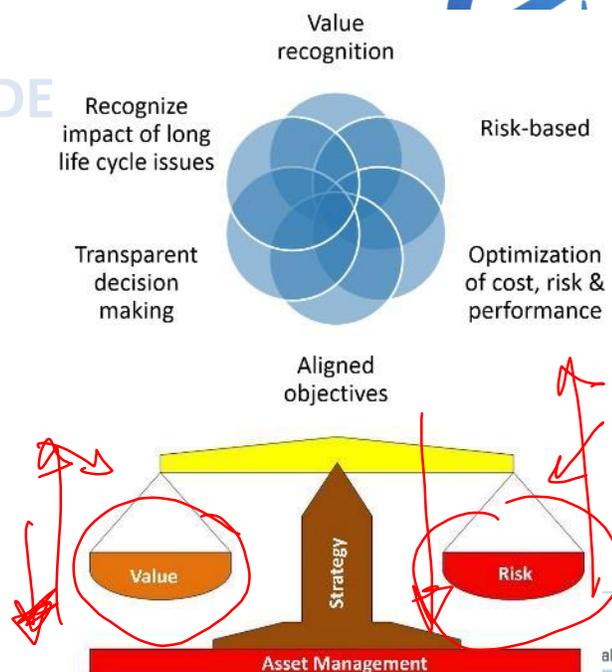
KEY PRINCIPLES OF ISO 55001

Value to Organization & its Stakeholders

Alignment and Strategic Planning

Leadership and Workplace Culture

Assurance of Fulfilment

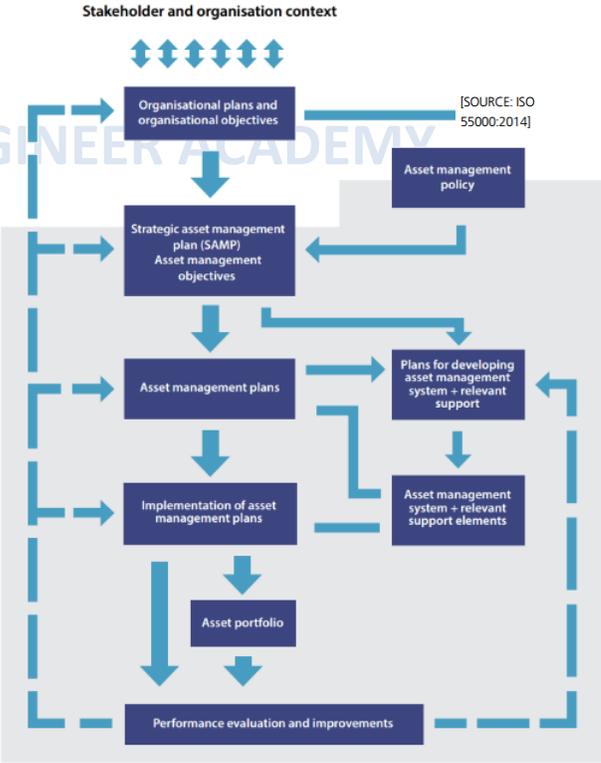




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Concept & strategy :

Key elements within an Asset Management System



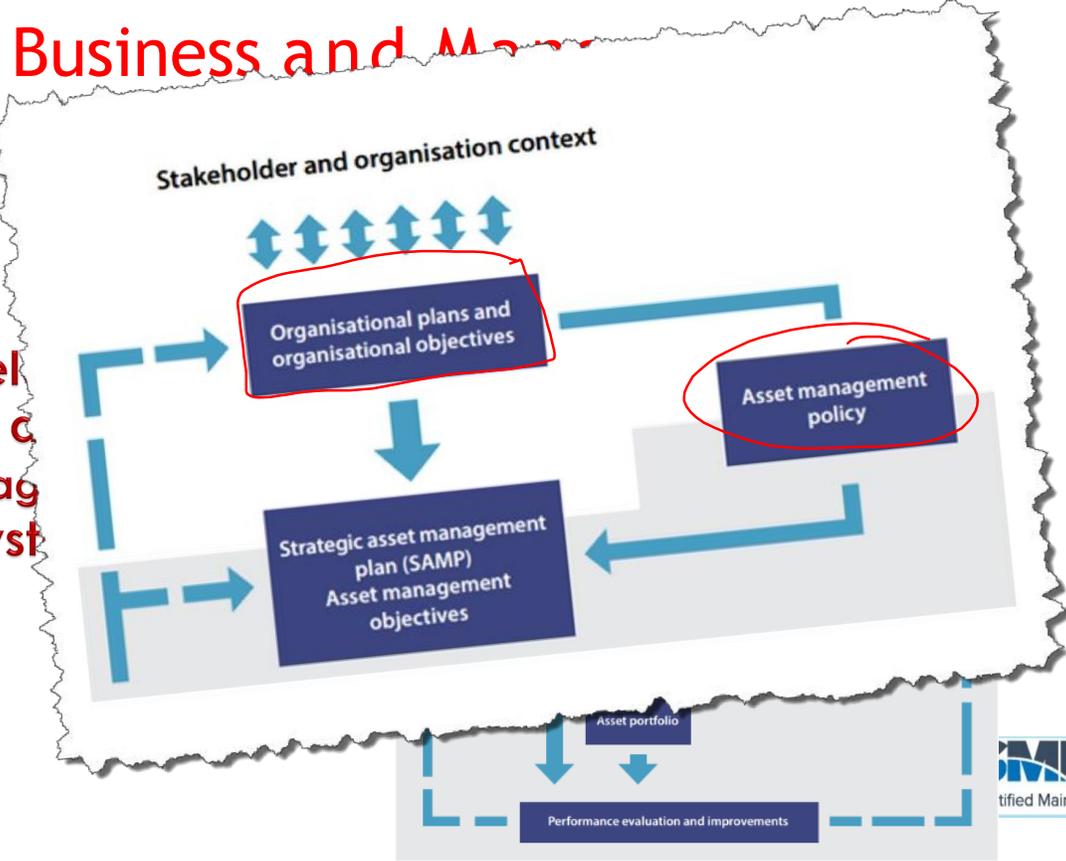
[SOURCE: ISO 55000:2014]



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Concept

Key elements within an Asset Management System

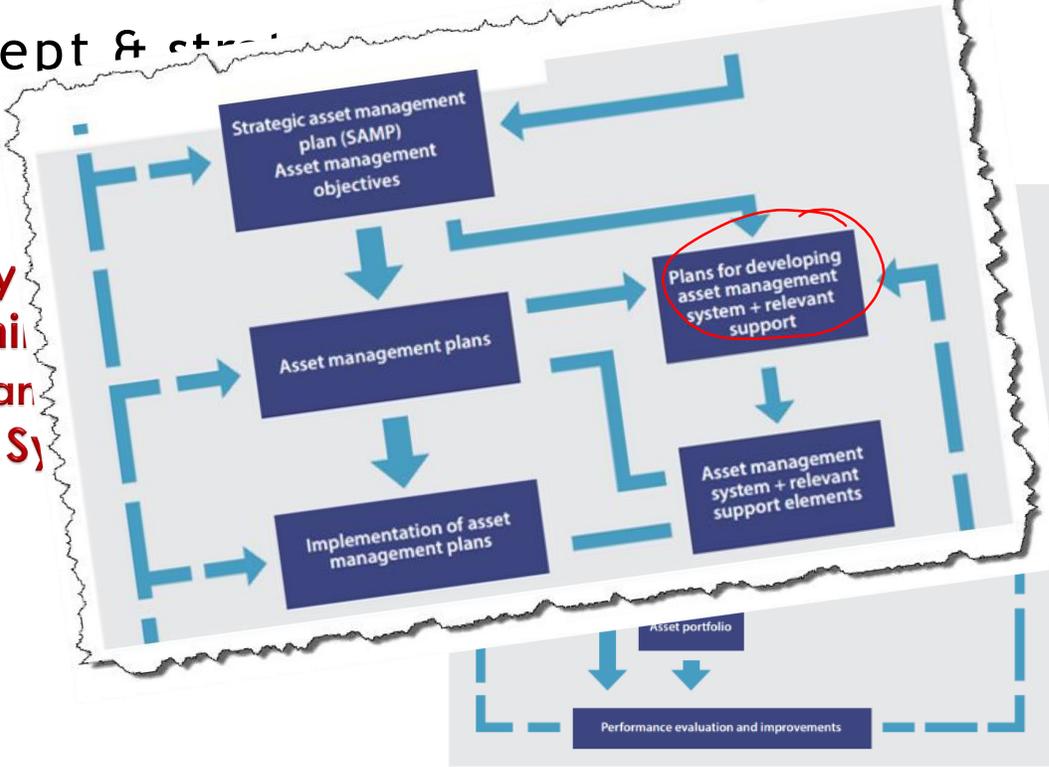




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Concept & strategy

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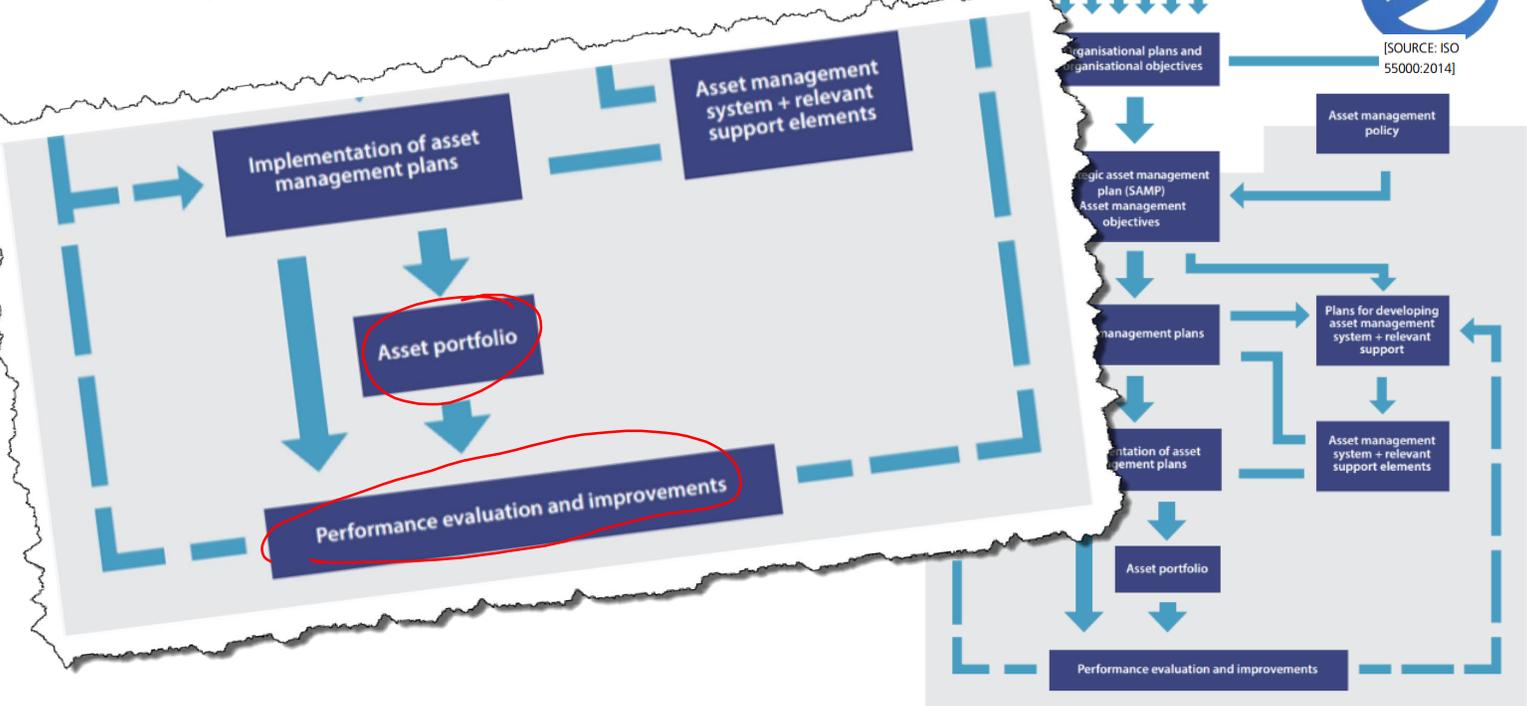
CMRP CMRP
Certified Maintenance & Reliability Professional

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Concept & strategy :



[SOURCE: ISO 55000:2014]





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Concept & strategy :

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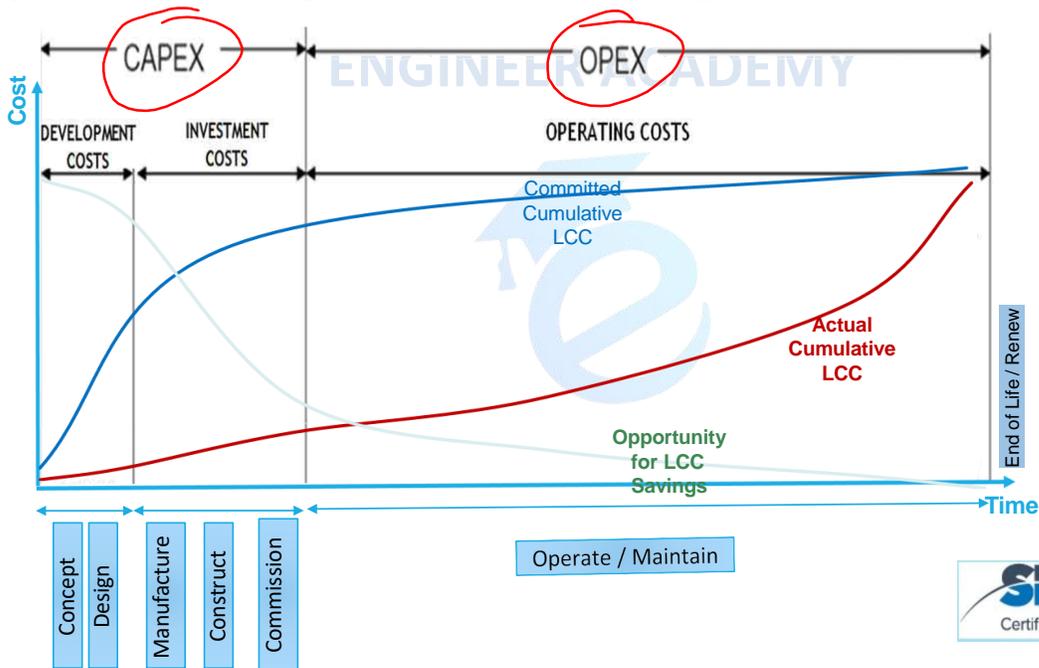
Asset Management Benefits

- Improved financial performance
- Informed asset investment decisions
- **Managed risk**
- Improved services and outputs
- Demonstrated social responsibility
- Demonstrated compliance
- **Enhanced reputation**
- Improved organizational sustainability
- Improved efficiency and effectiveness

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Concept & strategy : Asset Management Cycle



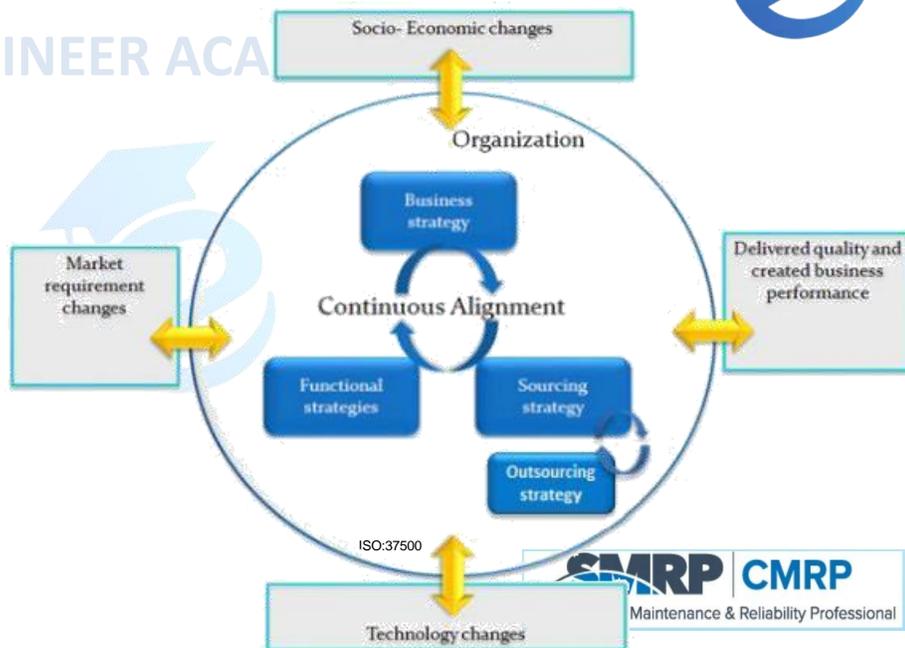
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Concept & strategy : Why we need to strategize?

Complex challenges and pressures implies organizations to put strategies and continually realign their strategies .

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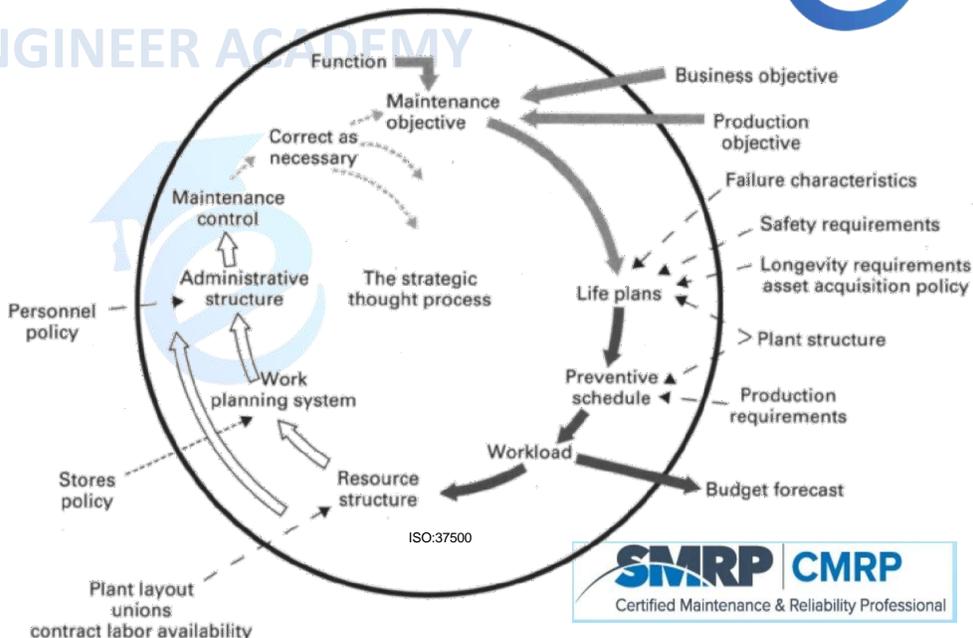
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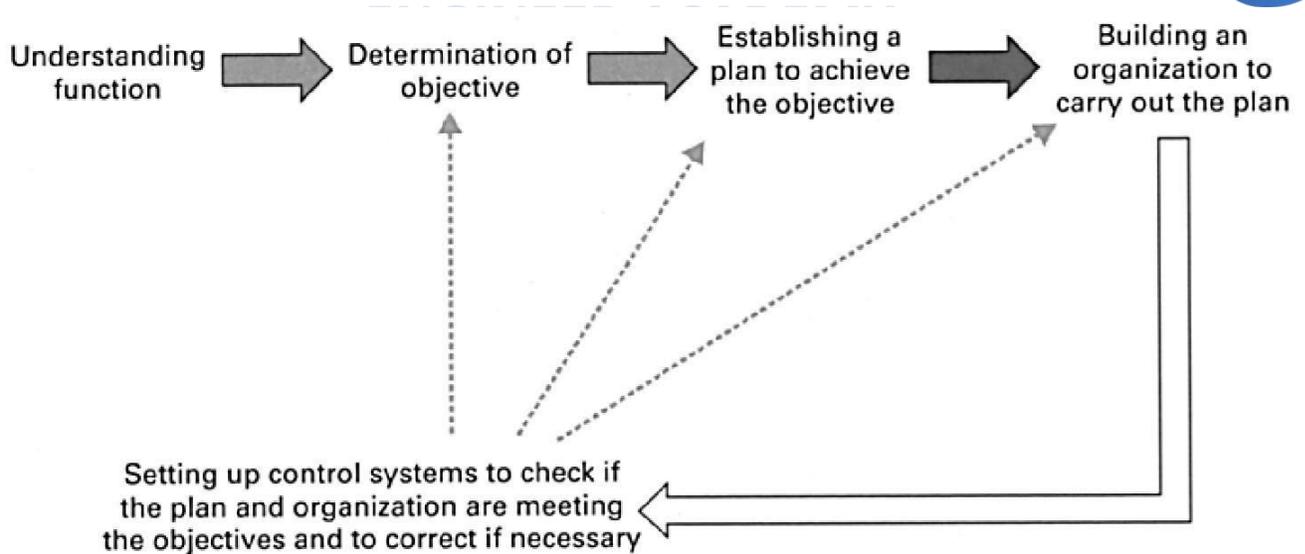
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Concept & strategy : Basic steps of management process



Certified Maintenance & Reliability Professional

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Concept & strategy

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This subject area describes the skills used to translate an organization's business goals into appropriate maintenance and reliability goals that support and contribute to the organization's business results.

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Concept & strategy

1. Create Strategic direction and plan for M&R operations
2. Administer Strategic plan
3. Measure Performance
4. Manage organizational plan
5. Communicate with stakeholders
6. Manage environmental-health-safety risk



Pillar 1 - Business and Management



1.1 Create strategic direction and plan for M&R operations

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Provide vision and direction

Provide clear and measurable goals



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1. Create strategic direction and plan for M&R operations

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Maintenance and reliability leaders create:

- Vision
- Mission
- Strategic plan

To guide implementation of appropriate maintenance and reliability processes in order to achieve organizational business goals.



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1.1 Create strategic direction and plan for M&R operations

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Vision:

The achievable dream of what an organization or a person wants to do and where it wants to go.

Vision Statement:

An overarching statement of the way an organization wants to be; an ideal state of being at a future point.



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1.1 Create strategic direction and plan for M&R operations

Vision Statement Examples:

Organization	Vision Statement
<i>The Coca Cola Company</i>	"Bringing to the world a portfolio of beverage brands that anticipate and satisfy peoples' desires and needs. Also, being a great place to work where people are inspired to be best they can be."
<i>The Ford Motor Company</i>	"To become the world's leading consumer company for automotive products and services."
<i>Kraft Foods</i>	"Helping People Around the World Eat and Live Better."
<i>Wal-Mart</i>	"To give ordinary folk the chance to buy the same things as rich people."
<i>Harley-Davidson</i>	"To fulfill dreams through the experiences of motorcycling."
<i>The Society for Maintenance & Reliability Professionals (SMRP)</i>	"To become the global organization known for providing competitive advantage through improved physical asset management."
	"To be a premiere resource for advancing Physical Asset Management (modified 07/14/10)."



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1. Create strategic direction and plan for M&R operations

Examples of some maintenance vision statements :

1. To leverage a highly-skilled workforce and employ effective maintenance strategies in order to position XYZ organization as the leading manufacturer across the industry.
2. A world-class maintenance system with a standardized approach to plan, execute, track, and analyze maintenance and production processes.



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1. Create strategic direction and plan for M&R operations

Mission :

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The mission better answer four questions:

1. What do we do? What is the purpose of the organization?
2. How do we do it? What's unique about the organization?
3. For whom do we do it? Who are our customers and stakeholders?
4. What are our values and beliefs?



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1. Create strategic direction and plan for M&R operations

Three Main Benefits Attributed to Mission Statements

1. They help companies focus their strategy by defining some boundaries within which to operate.
2. They define the dimensions along which an organization's performance is measured and judged.
3. They suggest standards for individual ethical behavior.



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1. Create strategic direction and plan for M&R operations

Example Mission Statement of a Maintenance Department

1. To manage the business of maintenance in a manner that facilitates a production effort which yields high quality products, low operating costs, utilizes all resources, and involves production and maintenance employees working together towards a common goal.
2. To maximize equipment performance, fostering an environment of ownership and pride, through a structured approach to predictive and preventive maintenance.



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1. Create strategic direction and plan for M&R operations

Strategic plan

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The strategic plan provides:

- Clear purpose and demonstrated need
- Defined goals
- Benefits to the organization.



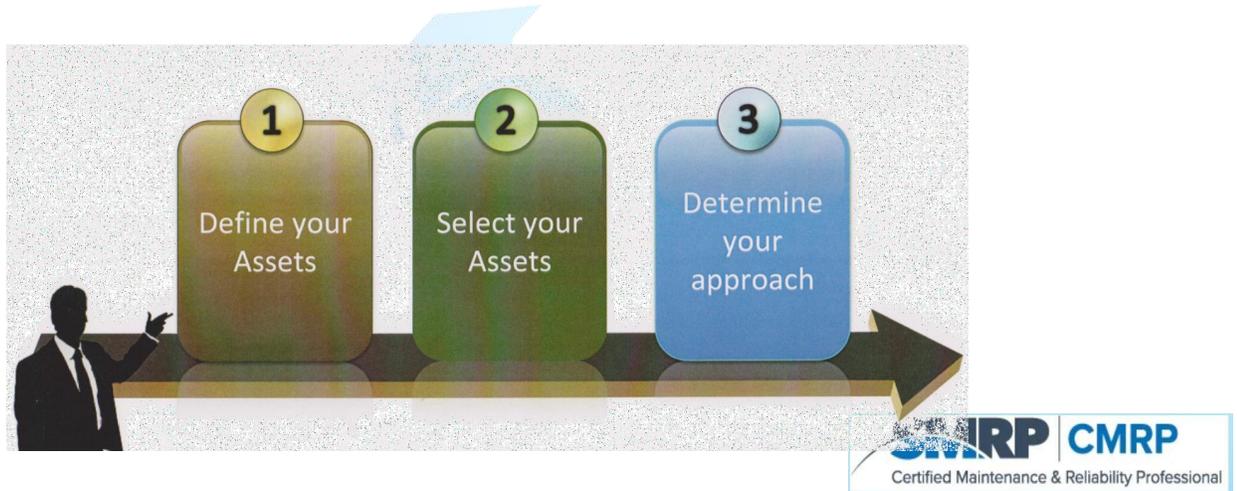
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1.1 Create strategic direction and plan for M&R operations

Strategic plan

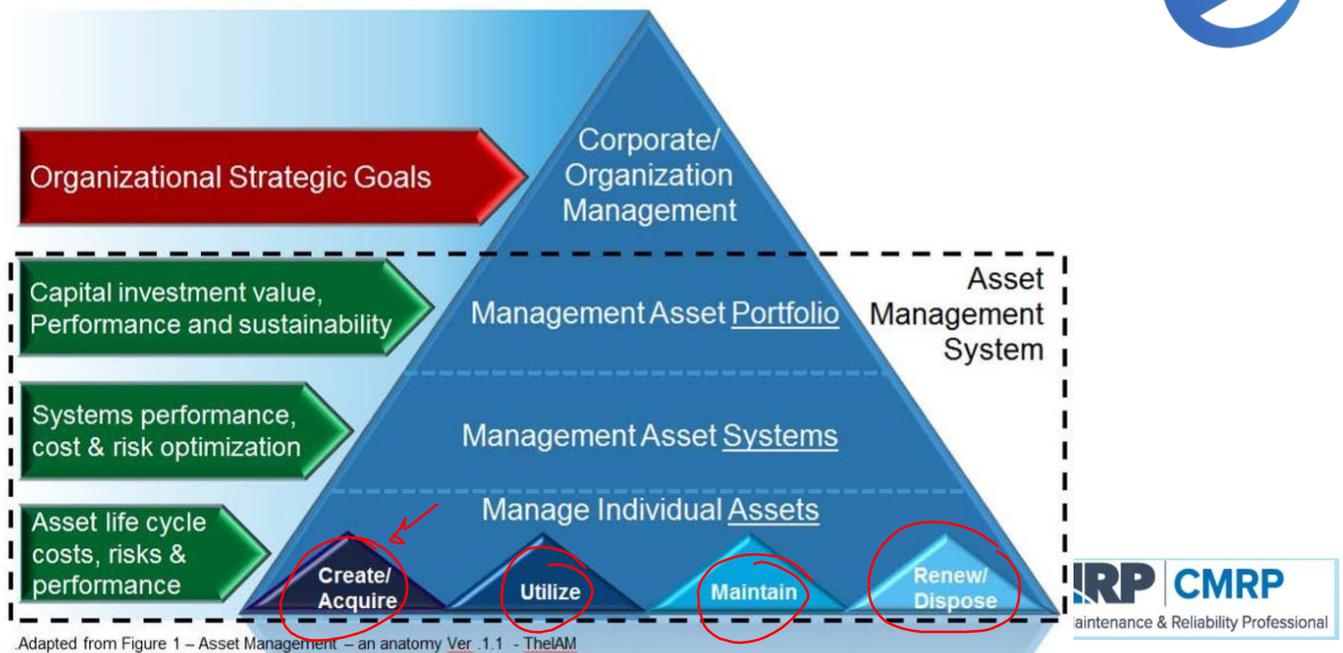
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1.1 Create strategic direction and plan for M&R operations



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1.1 Create strategic direction and plan for M&R operations

Typical Strategic Asset Management Plan Requirements

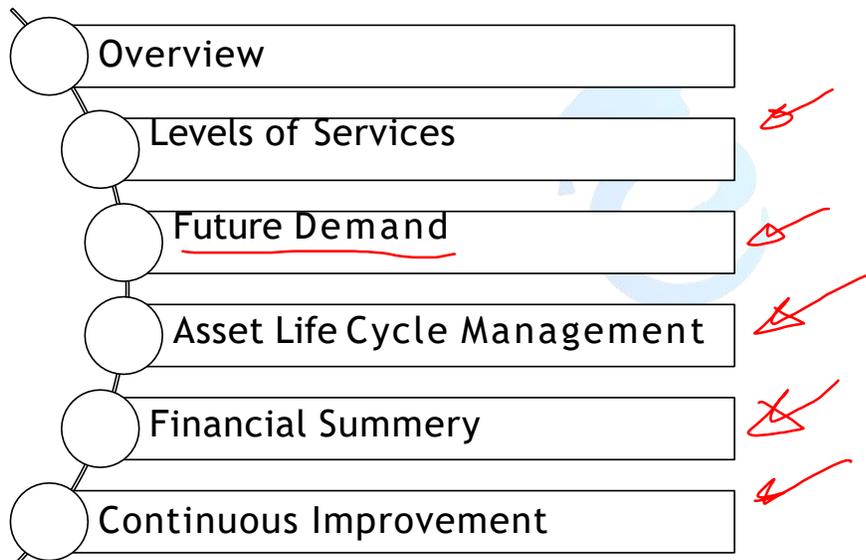


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1.1 Create strategic direction and plan for M&R operations

Typical Strategic Asset Management Plan Elements



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1. Create strategic direction and plan for M&R operations

Establishing Goals: ENGINEER ACADEMY

Maintenance and reliability leaders utilize their knowledge of industry benchmarks to:

- Establish these goals
- Provide a measurement system
- Determine gaps in their maintenance and reliability processes



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1. Create strategic direction and plan for M&R operations

Goals should be: ENGINEER ACADEMY

- Clear
- Measurable

Goals should be: SMART

Exam



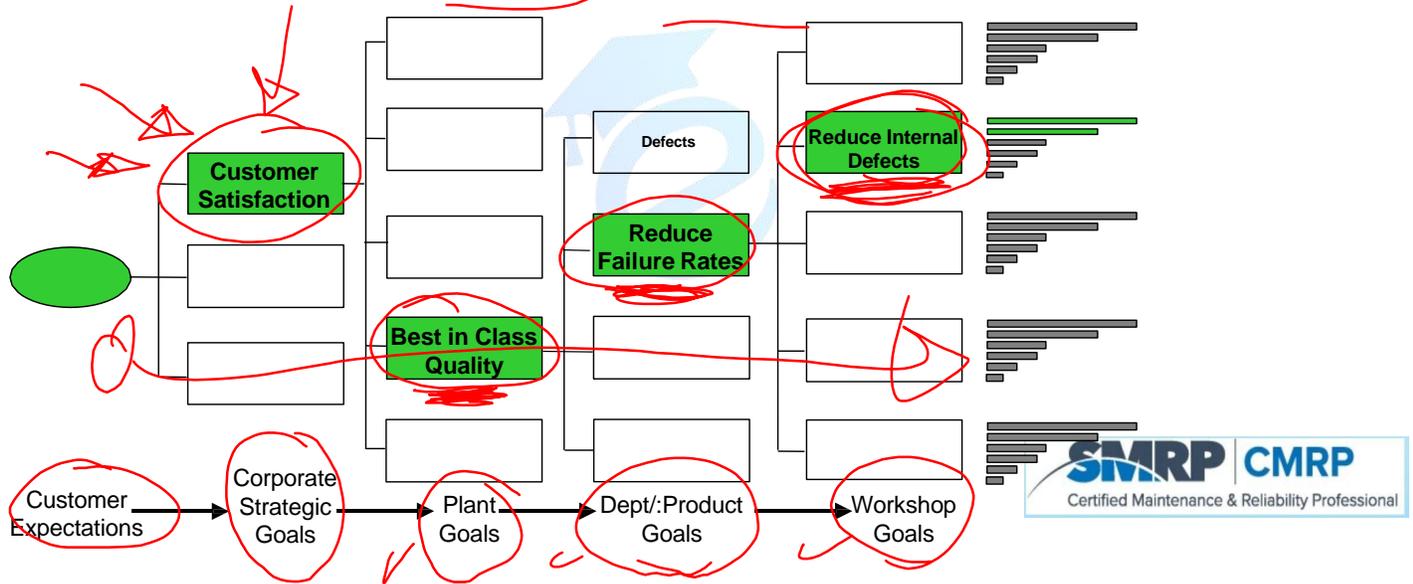
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1.1 Create strategic direction and plan for M&R operations

Goals should be:

- Established in a top-down (cascading) manner.

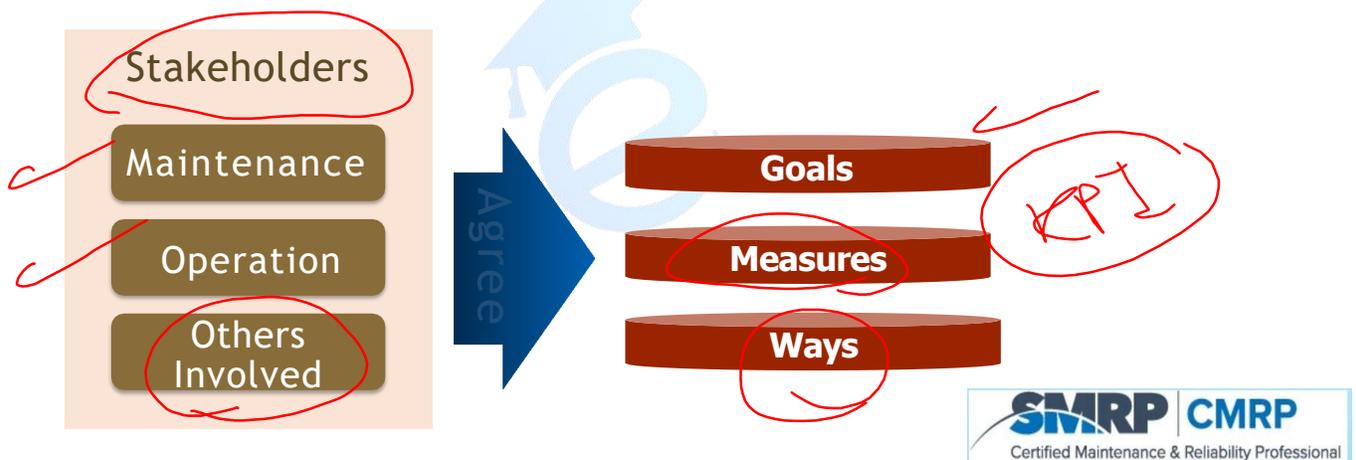


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1.1 Create strategic direction and plan for M&R operations

Operations, maintenance, and other involved disciplines to agree on the goals and the measures used to quantify them.



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1. Create strategic direction and plan for M&R operations

Equally important is an understanding of roles and responsibilities in the strategic plan.

Routine review and discussion of progress will ensure:

- 1) Team commitment
- 2) Provide an opportunity to make periodic adjustments to the plan that may be required.



1. What is defined as "the achievable dream of what an organization or a person wants to do and where it wants to go"?

- A. Mission.
- B. Strategic Plan.
- C. Vision.
- D. Goal.
- Correct Answer: C





2. Which of the following is **NOT** one of the four key questions a Mission statement better answers?

- A. What do we do?
- B. What are our values and beliefs?
- C. For whom do we do it?
- D. What is our financial projection for the year?

• Correct Answer: D

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3. A strategic plan is designed to guide implementation of appropriate M&R processes in order to achieve what primary objective?

- A. To minimize all capital expenditures.
- B. To achieve organizational business goals.
- C. To maximize the maintenance budget.
- D. To hire the maximum number of technicians.

• Correct Answer: B

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4. According to the presentation, goals should be established in which manner?

- A. Bottom-up (from workshops to corporate).
- B. Randomly based on immediate needs.
- •C. Top-down (cascading).
- D. Based solely on industry benchmarks.

•Correct Answer: C

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5. The "A" in the SMART acronym for setting goals stands for:

- A. Accountable.
- B. Actionable.
- •C. Achievable.
- D. Auditable.

•Correct Answer: C

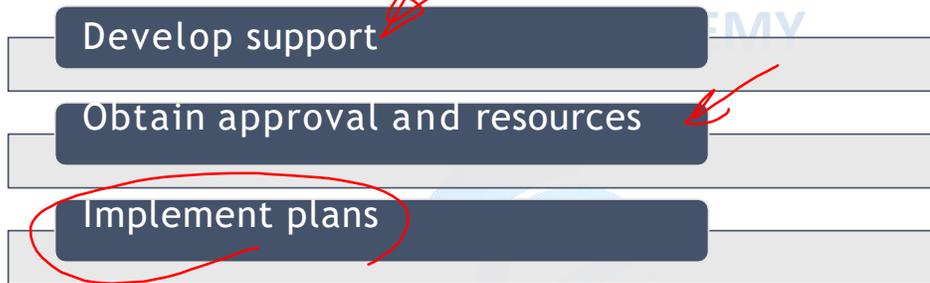
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1.2 Administer strategic plan



Pillar 1 - Business and Management



1.2 Administer strategic plan

In order to obtain the support and resources required to implement the strategic plan, a solid business case should be developed that:

- Specifies the benefits in financial terms.
- Should include an understanding of the changes that will be required to:
 - The organization structure ✓
 - Personnel ✓
 - Roles and responsibilities ✓
 - Tools ✓
 - Training priorities. ✓



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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

Return On Net Assets - RONA



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THE MONEY LEFT AFTER OPERATING EXPENSES, INTEREST, TAXES, AND PREFERRED STOCK DIVIDENDS ARE DEDUCTED

NET INCOME

FIXED ASSETS + WORKING CAPITAL

LONG-TERM TANGIBLE EQUIPMENT OR PROPERTY USED TO PRODUCE THE COMPANY'S PRODUCTS

ASSETS MINUS LIABILITIES

IRP
y Professional

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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

EBITDA ACADEMY

HEY, DILBERT, WHAT ARE YOU DOING FOR THE EBITDA TODAY?

THE WHAT?

EBITDA MEANS THE EARNINGS BEFORE INTEREST, TAXES, DEPRECIATION, AND UM...AMMONIA.

ARE YOU SURE ABOUT AMMONIA?

WHY MUST YOU BE SO ACCRETTIVE?

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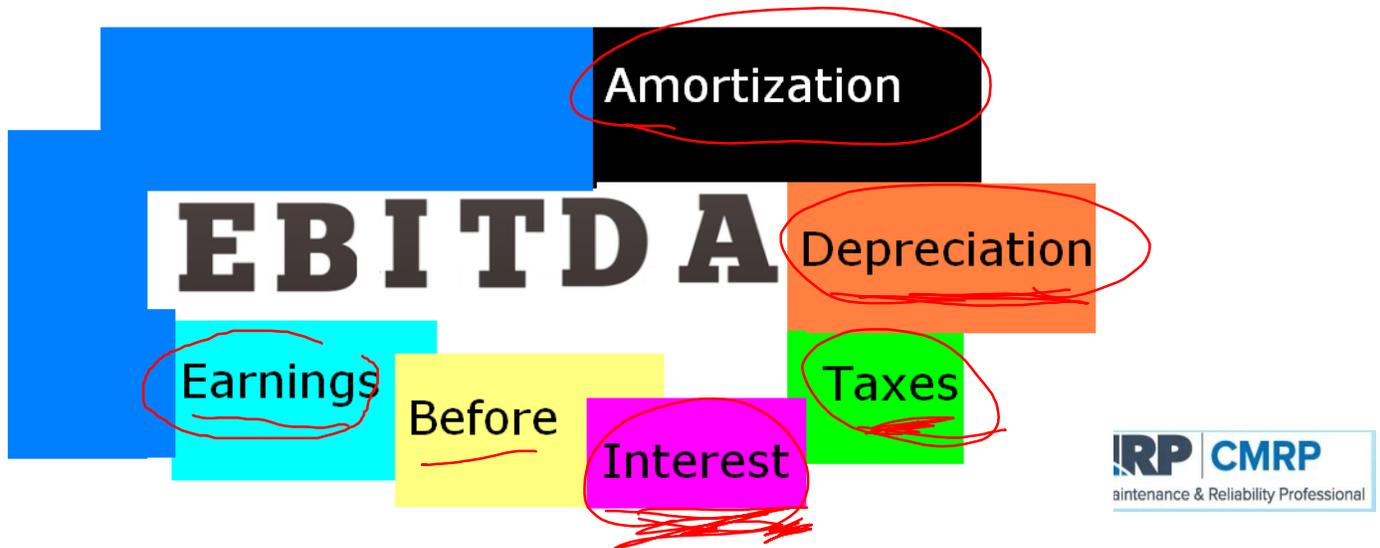
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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

EBITDA ACADEMY



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1.2 Administer strategic plan - Develop Business Case

Amortization usually refers to spreading an **intangible asset's** cost over that asset's useful life. For example, a patent on a piece of medical equipment usually has a life of 17 years. The cost involved with creating the medical equipment is spread out over the life of the patent, with each portion being recorded as an expense on the company's **income statement**.

Depreciation, on the other hand, refers to prorating a **tangible asset's** cost over that asset's life. For example, an office building can be used for a number of years before it becomes run down and is sold. The cost of the building is spread out over the predicted life of the building, with a portion of the cost being expensed each accounting year.

Depletion refers to the allocation of the cost of natural resources over time. For example, an oil well has a finite life before all of the oil is pumped out. Therefore, the oil well's setup costs are spread out over the predicted life of the oil well.

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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms. Return On Capital Employed (ROCE)

$$\text{ROCE} = \frac{\text{Earnings Before Interest and Tax (EBIT)}}{\text{Capital Employed}}$$

Earnings before interest and taxes
Total assets - Current liabilities



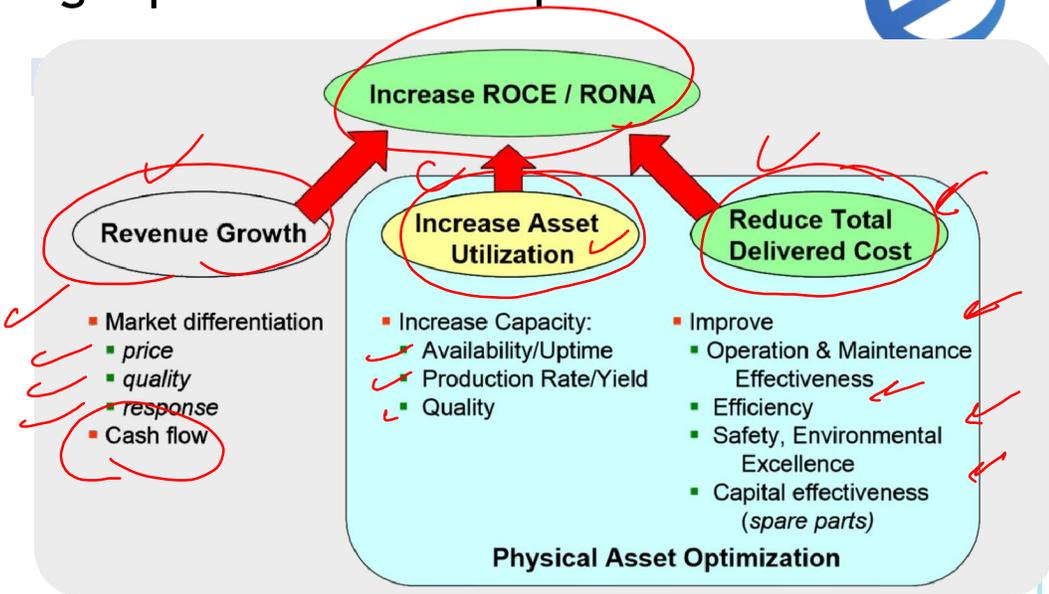
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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

- Role of physical asset optimization in improving financial situation.



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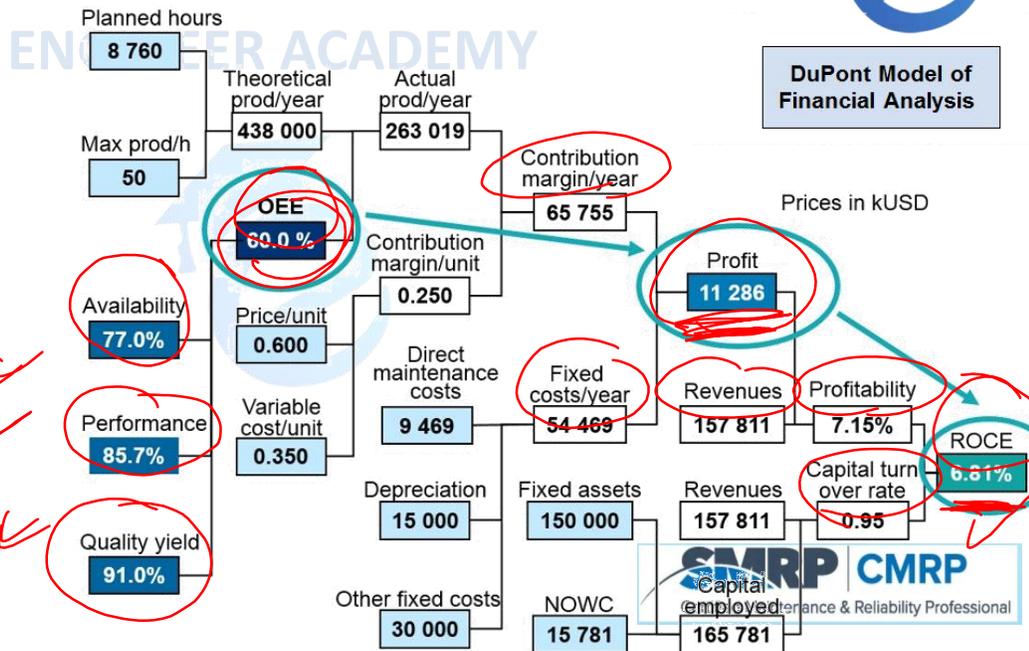


1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.
- Role of physical asset optimization in improving financial situation.

DuPont Model of Financial Analysis

OEE



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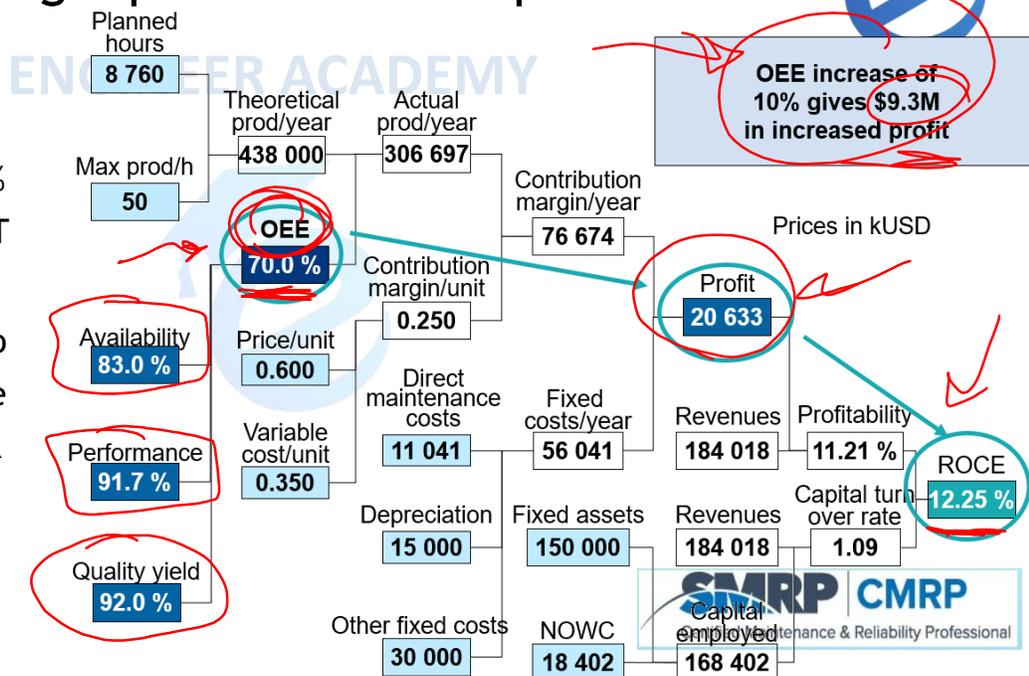


1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

Improving the OEE to 70% would almost double the EBIT to \$20.6 MUSD and RONA to 12.3% providing an easy to demonstrate how much the value associated with M&R improvement projects

OEE increase of 10% gives \$9.3M in increased profit



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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

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Replacement Asset Value (RAV)

Replacement Asset Value (RAV) is defined as the cost that would be incurred, in today's dollars, to replace the facility and equipment in its current configuration.

It is intended to represent the realistic value to replace the existing assets at new value.



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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

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Replacement Asset Value (RAV)

It includes:

- Building envelope
- All physical assets (equipment)
- The value of improvements to grounds (maintained on an ongoing basis)
- Capitalized engineering costs



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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

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Replacement Asset Value (RAV)

It doesn't include:

- Value of land
- The value of working capital
- Capitalized interest
- Pre-operational expense
- Mine, well, ...etc development



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1.2 Administer strategic plan - Develop Business Case

- M&R in financial terms.

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Replacement Asset Value (RAV)

How can be calculated:

- Original cost with inflation consideration
- Insured asset value provided by insurance companies
- Similar plants



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1.2 Administer strategic plan

Support for the resource requirements will be enhanced when management understands the value provided by the plan.

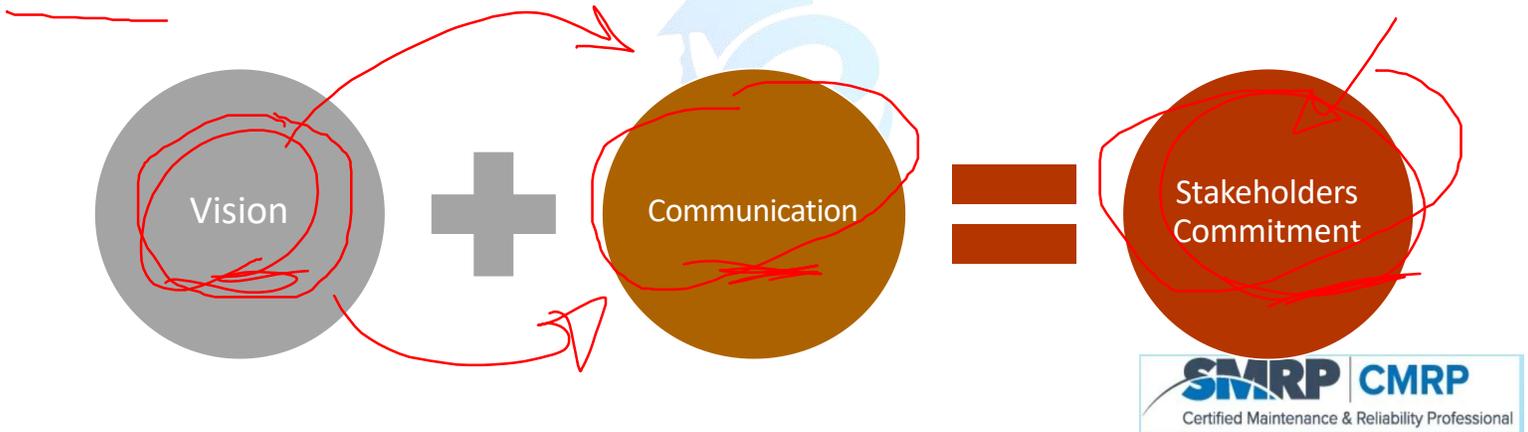


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1.2 Administer strategic plan

Maintenance and reliability leaders should communicate this vision to those with a stake in the process to garner commitment to implementation and execution of the plan..



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1.2 Administer strategic plan

This requires champions positioned to lead the effort and enlist support of customers, stakeholders and staff.





A solid business case developed to obtain support and resources for the strategic plan should primarily specify the benefits in what terms?

- A. Through a detailed list of required personnel changes.
- B. In financial terms.**
- C. By outlining the new maintenance technologies to be implemented.
- D. By specifying the new roles and responsibilities.

Correct Answer: B



Which financial metric is defined as "the cost that would be incurred, in today's dollars, to replace the facility and equipment in its current configuration"?

- A. Return On Net Assets (RONA).
- B. Replacement Asset Value (RAV).**
- C. Return On Capital Employed (ROCE).
- D. Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA).

Correct Answer: B





Which of the following is explicitly excluded from the calculation of Replacement Asset Value (RAV) in the context of the business case?

- A. All physical assets (equipment).
- B. Building envelope.
- C. Capitalized engineering costs.
- D. **Value of land.**

Correct Answer: D



To obtain the support and resources for the strategic plan, a solid business case must include an understanding of the changes required. Which area is one of those changes?

- A. Employee's personal vacation schedules.
- B. Competitor's strategic marketing plan.
- C. **The organization structure.**
- D. Quarterly market interest rates.

Correct Answer: C





What action is required of M&R leaders to garner commitment to the implementation and execution of the strategic plan?

- A. Secure a zero-cost budget for all new initiatives.
- B. Communicate the vision to those with a stake in the process.**
- C. Ensure every employee has the same ability to change.
- D. Develop only lagging performance indicators.

Correct Answer: B

