

Case study

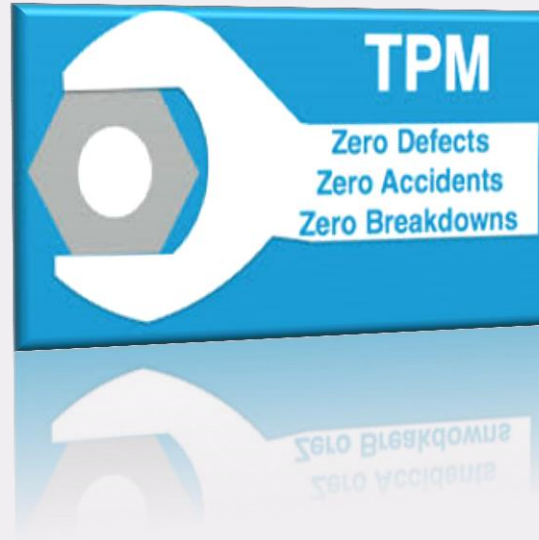
OEE

8 Pillars

Implementation

TPM

Agenda



Total Productive Maintenance



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1

What is TPM and Why ?

2

IMPLEMENTATION

3

MEASUREMENT

4

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TPM ?

TPM is system aimed to eliminate production losses due to equipment status, keeping the machines in a position to produce at

- ✓ Maximum Capacity
- ✓ Expected quality products
- ✓ No unscheduled stoppages



Why TPM ?

- Avoid wastage
- Producing goods without reducing quality
- Reduce cost

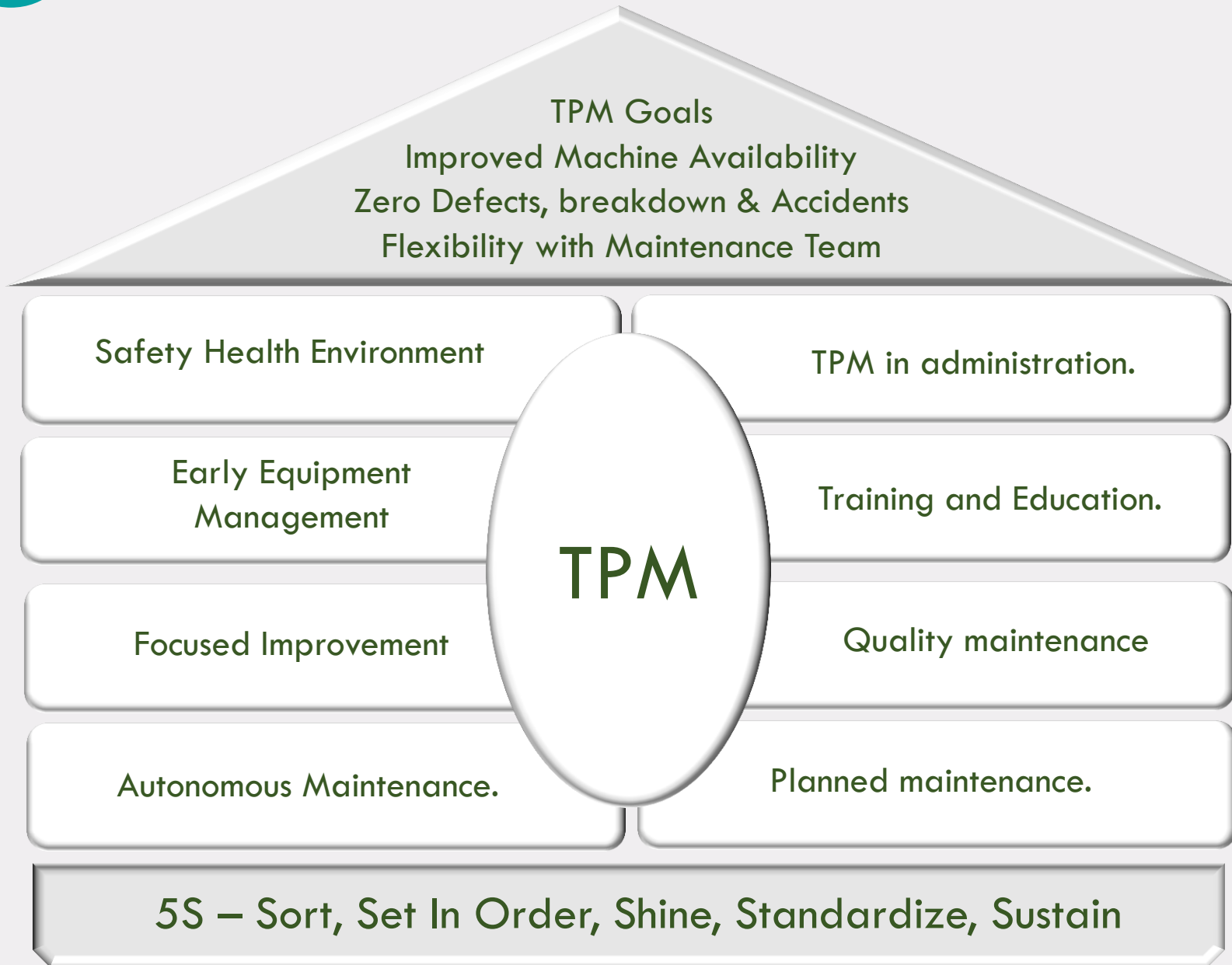


TPM

Agenda



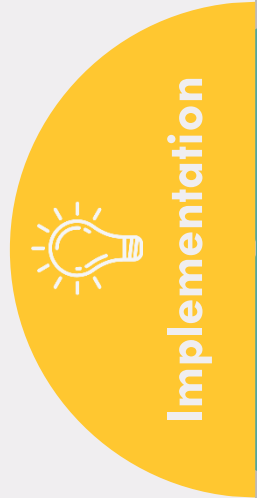
IMPLEMENTATION- 8 PILLARS



Case study

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8 Pillars





5S

Organizing the work space which helps to recognize the uncover problems.

1. **Sort** (eliminate anything that is not truly needed in the work area)
2. **Set in Order** (organize the remaining items)
3. **Shine** (clean and inspect the work area)
4. **Standardize** (create standards for performing the above three activities)
5. **Sustain** (ensure the standards are regularly applied)



Before

After

Before and after implementation of 5S at work place



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Autonomous Maintenance

- ✓ Routine Maintenance
- ✓ E.g.: Cleaning, lubricating.



Planned Maintenance

- ✓ Schedule the maintenance based on frequency of breakdowns.
- ✓ Reduces unplanned stoppages.



Quality Maintenance

- ✓ Design “Error detection” and prevention in production process.
- ✓ Helps to prevent defects from being produced at first place.



Focused Improvement

- ✓ Equipment to perform as well every day as it does on its best day.
- ✓ Eliminating the losses one by one in the organizational process.



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Early Equipment Management

- ✓ structured process focusing on reducing the complexity associated with the real-time operation and **maintenance of equipment**.
- ✓ Innovation or customization.



Training and Educational

- ✓ It ensures that staff are trained in the skills identified as essential both for their personal development and for the successful deployment of TPM in line with the organization's goals and objectives.



Safety, Health, Environment

- ✓ Not just safety related but covers zero accidents, zero overburden (physical and mental stress and strain on employees) and zero pollution.



TPM in administration

- ✓ Apply TPM not only in plant but also in administration area.
- ✓ E.g. :Order processing, procurement and scheduling.



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Performance measurement in TPM (OEE)

What is OEE ?


Calculation of OEE requires “Six big losses”

Availability

%

Actual Time/Planned Production Time

1. Equipment Failure / Breakdown
2. Set up / Adjustments



Performance

%

Actual Production/Standard Production

3. Idling and Minor Stoppages
4. Reduced speed



Quality

%

Good/Total Production

5. Reduced Yield
6. Quality defects and Rework



 **OEE**

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$$\text{Thus, OEE}\% = \text{Performance}\% \times \text{Availability}\% \times \text{Quality}\%$$

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Before we gone

Production details for day

Total Production = 64,000 no's

Total Good = 62,950 No's Total Defects = 1050

Total Production machine hours available = $8 \times 20 = 160$ hrs.

Time losses :

Break down time = 2 hrs.

Power cut = 1 hrs.

Setup and Adj. = 1.5 hrs.

So Actual working hrs. = $20 - 4.5 = 15.5$ hrs.
= $15.5 \times 8 = 124$ hrs.

Standard production per day = 96,800 no's

Now Availability ratio = $15.5 / 20 = 77.5\%$

Performance ratio = $64,000 / 96,800 = 66.1\%$

Quality ratio = $62,950 / 64,000 = 98.35\%$

Now OEE% = $77.5\% \times 66.1\% \times 98.35\%$

= **50.38%**



As of Now

Production details for day

Total Production = 79,000 no's

Total Good = 78,165 No's Total Defects = 835

Total Production machine hours available = $8 \times 20 = 160$ hrs.

Time losses :

Break down time = 2 hrs.

Power cut = 1 hrs.

Setup and Adj. = 1.5 hrs.

So Actual working hrs. = $20 - 4.5 = 15.5$ hrs.
= $15.5 \times 8 = 124$ hrs.

Standard production per day = 96,800 no's

Now Availability ratio = $15.5 / 20 = 77.5\%$

Performance ratio = $79,000 / 96,800 = 81.6\%$

Quality ratio = $78165 / 79,000 = 98.9\%$

Now OEE% = $77.5\% \times 81.6\% \times 98.9\%$

= **62.54%**



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