



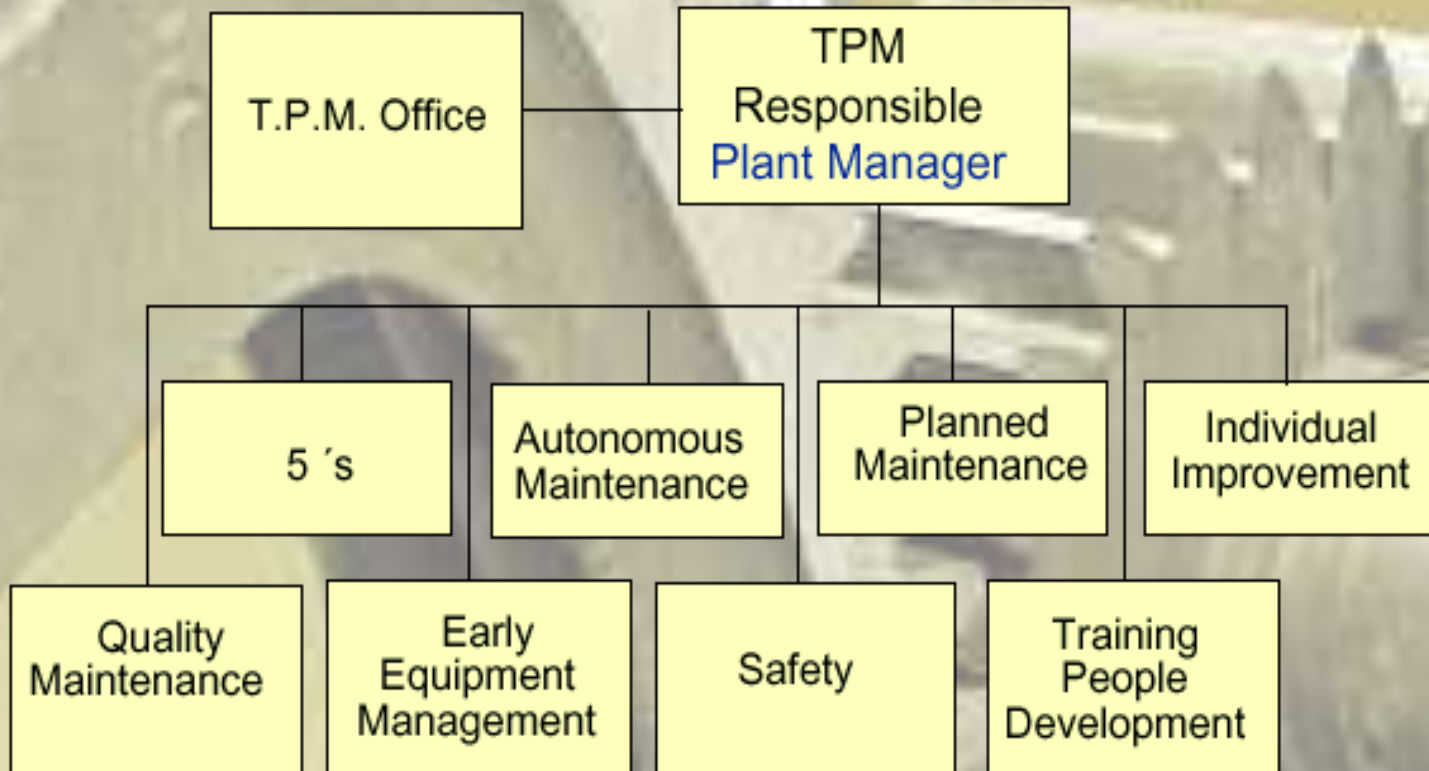
TPM

Total productive maintenance (TPM)

- It is a system of maintaining and improving the integrity of production and quality systems through the machines, equipment, processes, and employees that add business value to the organization.
- **Management + Operators + Maintenance**

Organizational Structure for TPM Implementation

T.P.M. PLANT WIDE STRUCTURE



Increase production

Increasing employee morale and job satisfaction

Goals of TPM

Hold emergency & unscheduled maintenance to a minimum

Maintenance is no – longer regarded as a Non – Profit activity

Why TPM.....?

Avoid wastage in quickly changing environment.

Goods send to Customers must be “ non – defective”

Reduce Cost of Manufacturing.

Produce a low batch quantity at the earliest possible time.

TPM TARGETS

PRODUCTION

- i). Obtain Minimum 80% Overall Production Efficiency
- ii). Obtain Minimum 90% Overall Equipment Effectiveness
- iii). Run the Machine during lunchtime.

QUALITY

Operate in a manner, so that there are no customer complaint.

COST

Reduce the manufacturing cost as much as possible.

SAFETY

Maintain an accident free environment.

MULTITASK

Develop multi skilled & flexible workers.

DELIVERY

Achieve 100% success in delivering the goods as required by the customer.

Five fundamental TPM activities

- 1. Autonomous maintenance
- 2. Equipment improvement
- 3. Quality maintenance
- 4. MP(Maintenance Prevention) system-building
- 5. Education and training

Table Five Fundamental TPM Development Activities

Five TPM Activities	Goals	Division	Level
Autonomous Maintenance	<ul style="list-style-type: none"> • Eliminate six major losses and raise overall equipment effectiveness through small group activities • Educate workers in equipment-related knowledge and skills • Improve equipment, change workers' approaches, and revitalize the workshop 	Production	Operators
Equipment Improvement	<ul style="list-style-type: none"> • Eliminate six major losses and maximize overall equipment effectiveness • Master improvement methods for maximizing equipment effectiveness 	Production	Managers
Quality Maintenance	<ul style="list-style-type: none"> • Ensure 100% product quality by establishing and maintaining conditions for zero defects 	Production	Managers and operators
MP System-building	<ul style="list-style-type: none"> • Create a system ensuring that information and techniques gained through in-house TPM activities are reflected in the design of machine tools sold outside the company 	Machine tools plant Tools and bearings plants	Engineering Production engineering
Education and Training	<ul style="list-style-type: none"> • Educate workers in equipment-related knowledge and skills • Improve and expand maintenance skills 	TQC promotion office	TPM administration

PILLARS OF TPM

AUTONOMOUS MAINTENANCE
(JISHU HOZEN)

KOBE TSU KAIZEN

PLANNED MAINTENANCE

QUALITY MAINTENANCE

TRAINING

OFFICE TPM

SAFETY, HEALTH AND
ENVIRONMENT

5S

Pillar-1 5S

Japanese Term	English Translation	Equivalent 'S' term
Seiri	Organization	Sort
Seiton	Tidiness	Systematize
Seiso	Cleaning	Sweep
Seiketsu	Standardization	Standardize
Shitsuke	Discipline	Self-Discipline

Pillar-2 JISHU HOZEN

- **Policy**
 - Uninterrupted operation of equipments.
 - Flexible operators to operate and maintain other equipments.
 - Eliminating the defects at source through active employee participation.
 - Stepwise implementation of JH activities.
- **JISHU HOZEN Targets**
 - Prevent the occurrence of 1A/1B because of JH.
 - Reduce oil consumption by 50%.
 - Reduce process time by 50%.
 - Increase use of JH by 50%.

- Steps in JISHU HOZEN
 - Preparation of employees.
 - Initial cleanup of machines.
 - Take counter measures.
 - Fix tentative JH standards.
 - General inspection.
 - Autonomous inspection.
 - Standardization.
 - Autonomous management.

Pillar 3 - KAIZEN

- Kai means change and Zen means good
- The principle behind is a very large number of small improvements are more effective in an organizational environment than a few improvements of large value.
- Policy
 - Practice concepts of zero losses in every activity
 - To achieve cost reduction targets in all resources
 - To improve over all plant equipment effectiveness
 - Focus of easy handling of operators

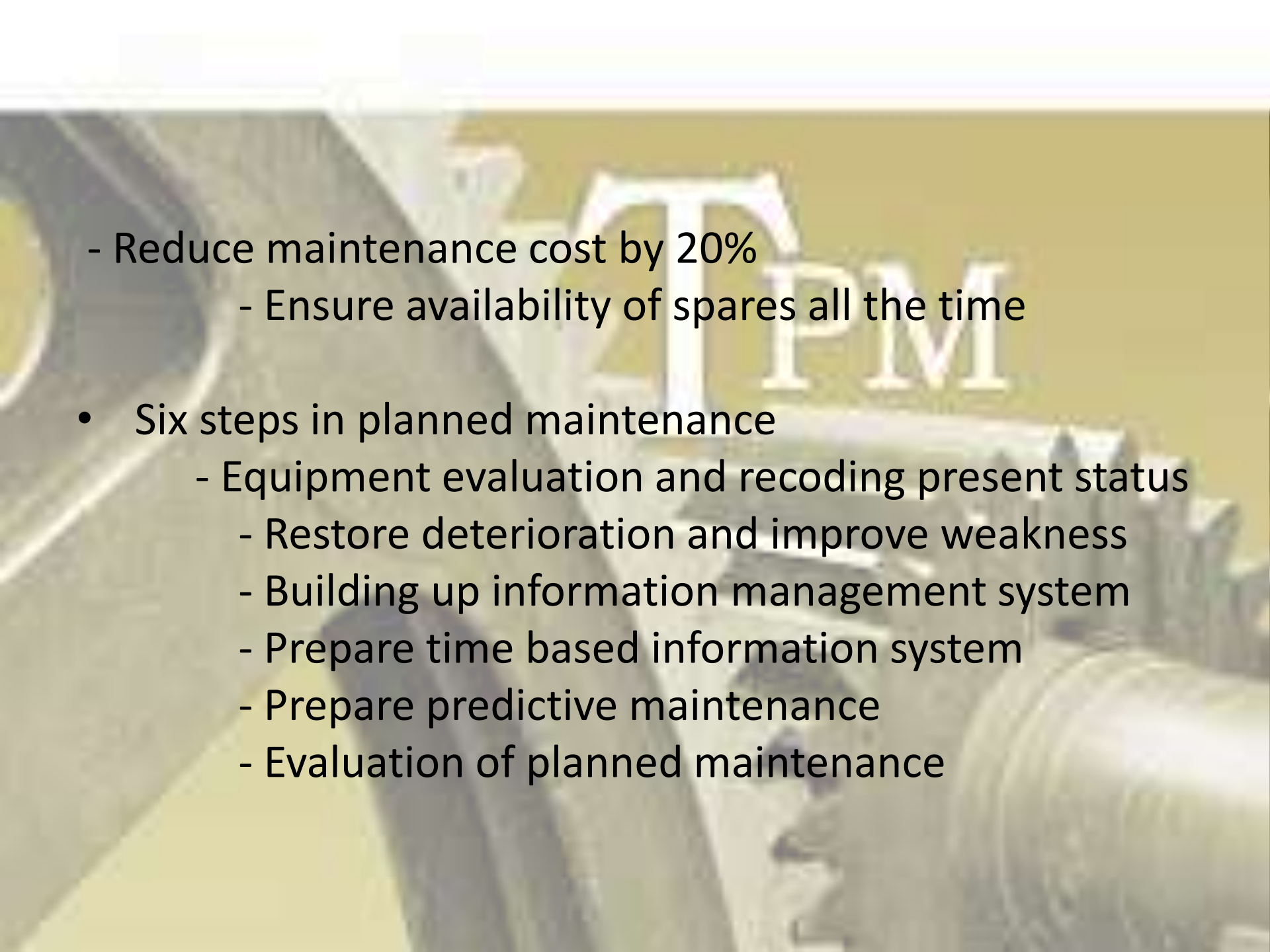
Target

- Achieve and sustain zero losses with respect to minor stops, measurement and adjustments
- It also aims to achieve 30% manufacturing cost reduction

Loss	Category
Failure losses, Setup losses, Cutting blade loss, Startup losses, Minor stoppage loss, speed loss, Defect loss and scheduled downtime loss	Losses that impede equipment efficiency
Management loss, Operating motion loss, Line organization loss, logistic loss, Measurement and adjustment loss	Losses that impede human work efficiency
Energy loss, Tool breakage loss, Yield loss	Losses that impede effective use of production resources

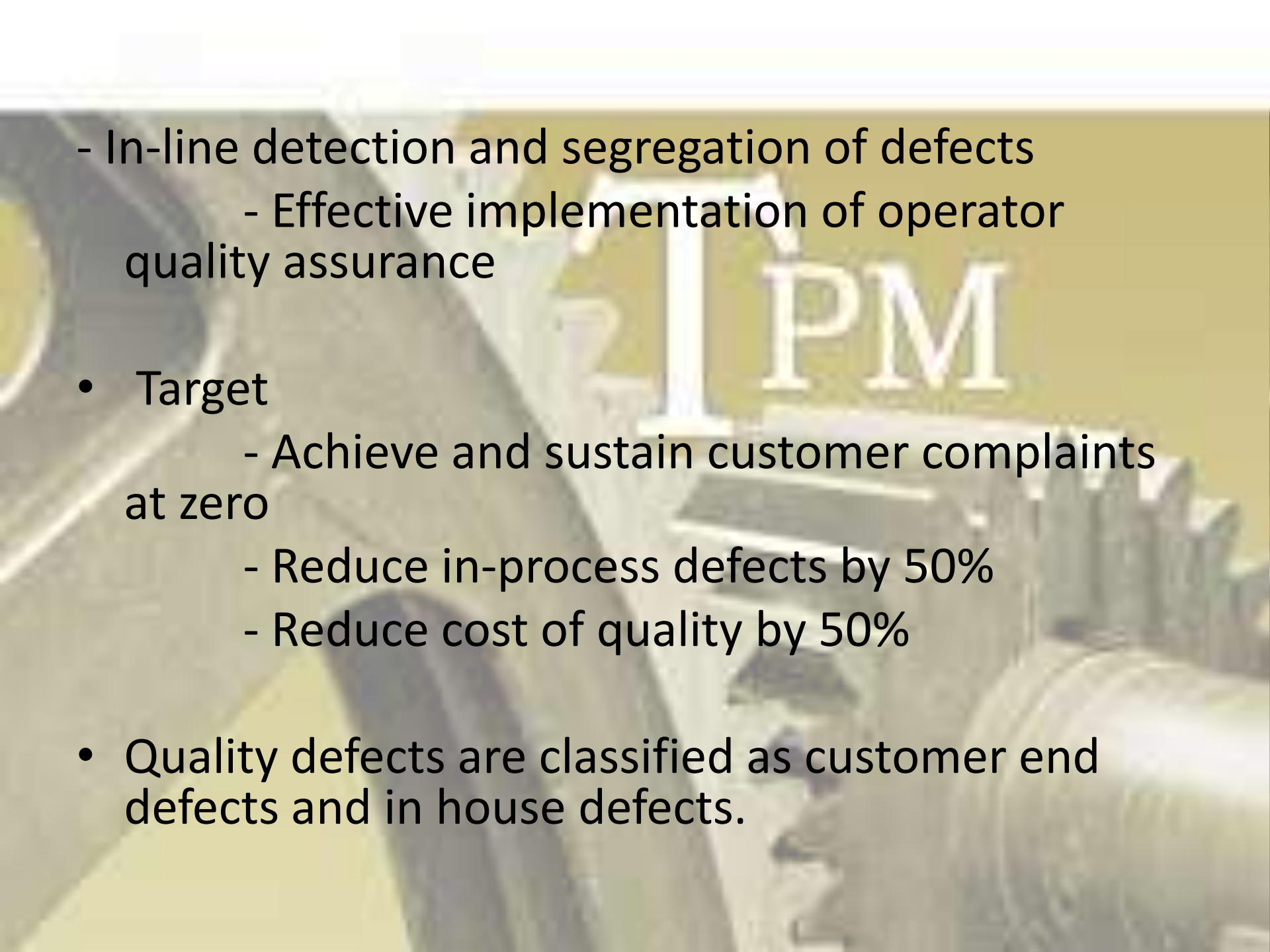
Pillar 4 – PLANNED MAINTENANCE

- It is aimed to have trouble free machines and equipments producing defect free products for total customer satisfaction.
- Break down into 4 categories.
 - Preventive Maintenance
 - Breakdown Maintenance
 - Corrective Maintenance
 - Maintenance Prevention
- Target
 - Zero equipment failure and break down.
 - Improve reliability and maintainability by 50%.

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- Reduce maintenance cost by 20%
 - Ensure availability of spares all the time
 - Six steps in planned maintenance
 - Equipment evaluation and recoding present status
 - Restore deterioration and improve weakness
 - Building up information management system
 - Prepare time based information system
 - Prepare predictive maintenance
 - Evaluation of planned maintenance

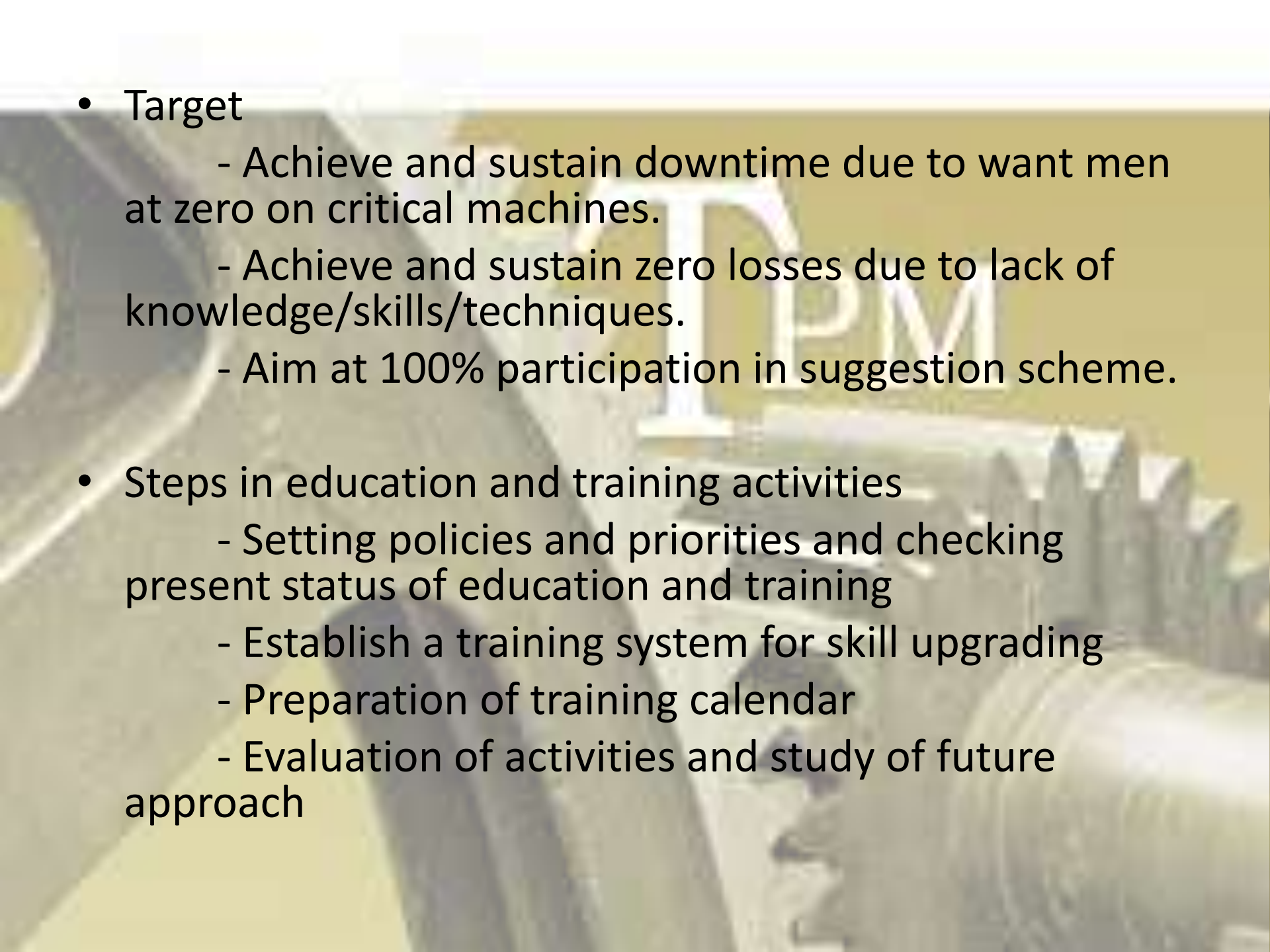
Pillar 5 – QUALITY MAINTENANCE

- It is aimed towards customer delight through highest quality through defect free manufacturing.
- QM activity is to set equipment conditions that preclude quality defects, based on the basic concept of maintaining perfect equipment to maintain perfect quality of products.
- Policy
 - Defect free conditions and control of equipments
 - QM activities to support quality assurance
 - Focus of prevention of defects at source
 - Focus on poka-yoka (fool proof system)

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- The background of the slide features a blurred image of a person in a white lab coat operating a piece of industrial machinery. Overlaid on this image is the text 'TPM' in a large, white, serif font. The overall color palette is muted, with greys, whites, and soft yellows.
- In-line detection and segregation of defects
 - Effective implementation of operator quality assurance
 - Target
 - Achieve and sustain customer complaints at zero
 - Reduce in-process defects by 50%
 - Reduce cost of quality by 50%
 - Quality defects are classified as customer end defects and in house defects.

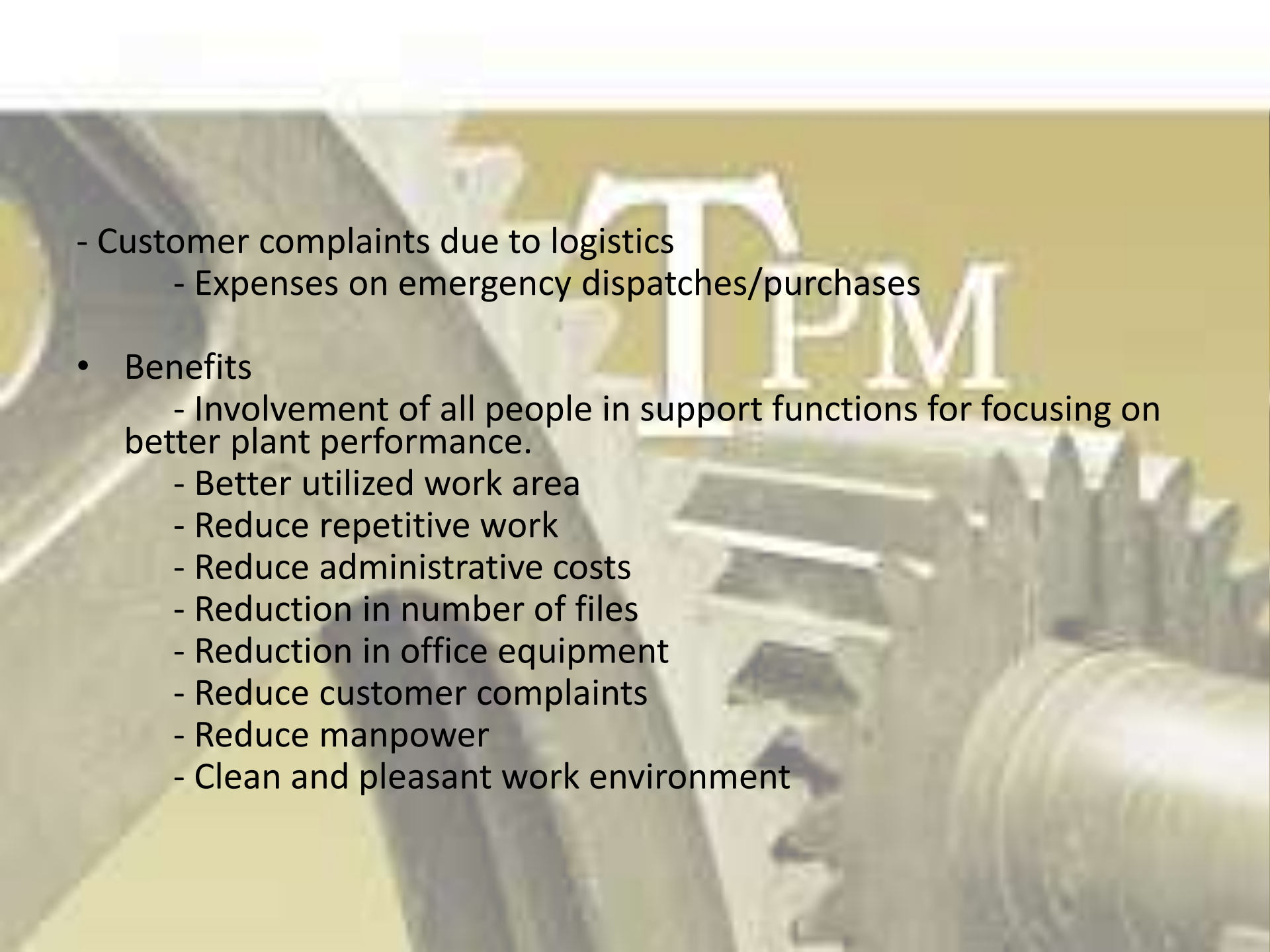
Pillar 6 - TRAINING

- It is aimed to have multi skilled employees whose morale is high and who has eager to come to work and perform all required functions effectively and independently.
- They are trained to achieve 4 phases of skills
 - Phase 1 : Do not know
 - Phase 2 : Know the theory but cannot do
 - Phase 3 : Can do but cannot teach
 - Phase 4 : Can do and also teach
- Policy
 - Focus on improvement of knowledge and skills
 - Create a training environment for self learning
 - Training to remove employee fatigue and make work enjoyable

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- Target
 - Achieve and sustain downtime due to want men at zero on critical machines.
 - Achieve and sustain zero losses due to lack of knowledge/skills/techniques.
 - Aim at 100% participation in suggestion scheme.
 - Steps in education and training activities
 - Setting policies and priorities and checking present status of education and training
 - Establish a training system for skill upgrading
 - Preparation of training calendar
 - Evaluation of activities and study of future approach

Pillar 7 – OFFICE TPM

- Office TPM should be started after activating four other pillars of TPM (JH, KK, QM, PM).
- Office TPM addresses 12 major losses
 - Processing loss
 - Cost loss in areas like accounts, marketing and sales
 - Communication loss
 - Idle loss
 - Set-up loss
 - Accuracy loss
 - Office equipment breakdown, telephones and fax
 - Communication channel breakdown
 - Time spent on retrieval of information
 - Non availability of correct on line stock status

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- The background of the slide features a large, semi-transparent logo for Total Productive Maintenance (TPM). The letters 'TPM' are prominently displayed in a white, serif font. Below the letters, there is a stylized graphic of interlocking gears, suggesting a mechanical or industrial context. The overall color scheme is a mix of light beige and grey tones.
- Customer complaints due to logistics
 - Expenses on emergency dispatches/purchases
 - Benefits
 - Involvement of all people in support functions for focusing on better plant performance.
 - Better utilized work area
 - Reduce repetitive work
 - Reduce administrative costs
 - Reduction in number of files
 - Reduction in office equipment
 - Reduce customer complaints
 - Reduce manpower
 - Clean and pleasant work environment

Pillar 8 – SAFETY, HEALTH AND ENVIRONMENT

- Target
 - Zero accident
 - Zero Health damage
 - Zero fires
- It helps to create a safe workplace and a surrounding area that is not damaged by our process or procedures.
- It plays an active role in each of the other pillars on a regular basis.
- To create awareness among employees various competitions like safety slogans, quiz, drama, posters etc can be organized at regular intervals.

Direct Benefits of TPM

Increase Productivity and Overall Plant Efficiency by 1.5 to 2 times

Rectify customers complaints.

Reduce accidents

Satisfy the customers needs by 100%

Indirect Benefits of TPM

Higher confidence level among the workers

Keep the work place clean, neat and attractive

Achieve goals by working as Team

Favourable change in the attitude of the operators

“Quality is a Journey,
not a Destination”

