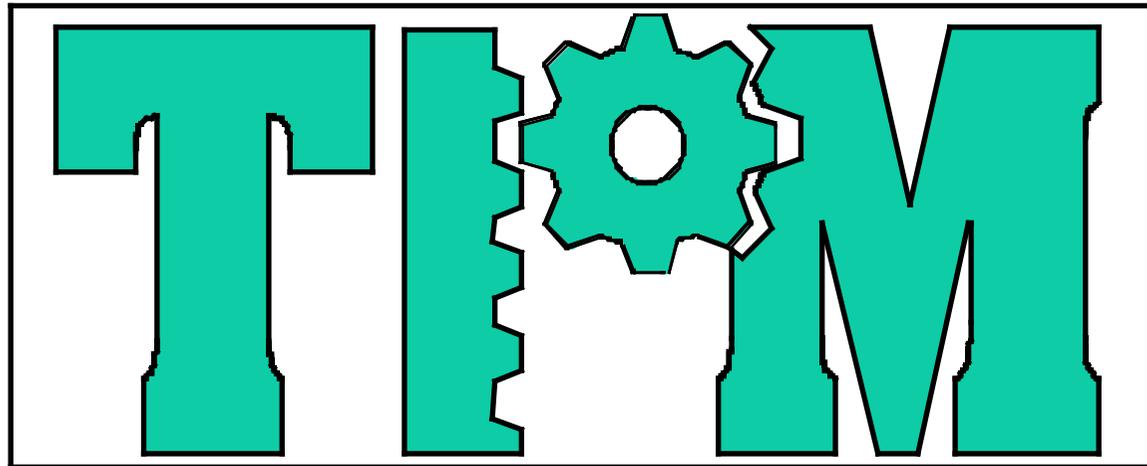


Courtesy, in part, of Motorola SPS.  
Thank You!

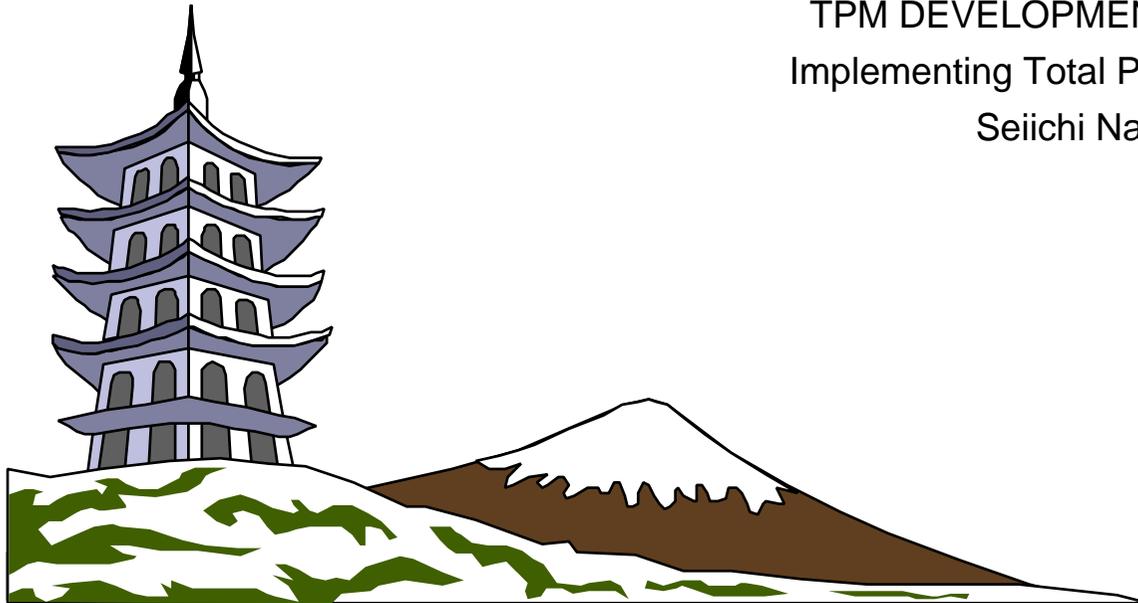
*Welcome To*



## About T.P.M.

After World War II, Japanese industries determined that to compete successfully in the world market they had to improve the quality of their products. To do so, they imported management and manufacturing techniques from the United States and adapted them to their circumstances. Subsequently, their products became known throughout the world for their superior quality, focusing world attention on Japanese-style management techniques.

TPM DEVELOPMENT PROGRAM  
Implementing Total Productive Maintenance  
Seiichi Nakajima.



## WHAT IS T.P.M. ??



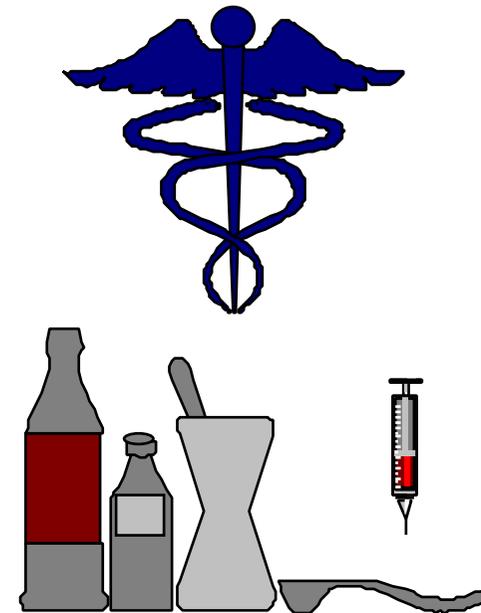
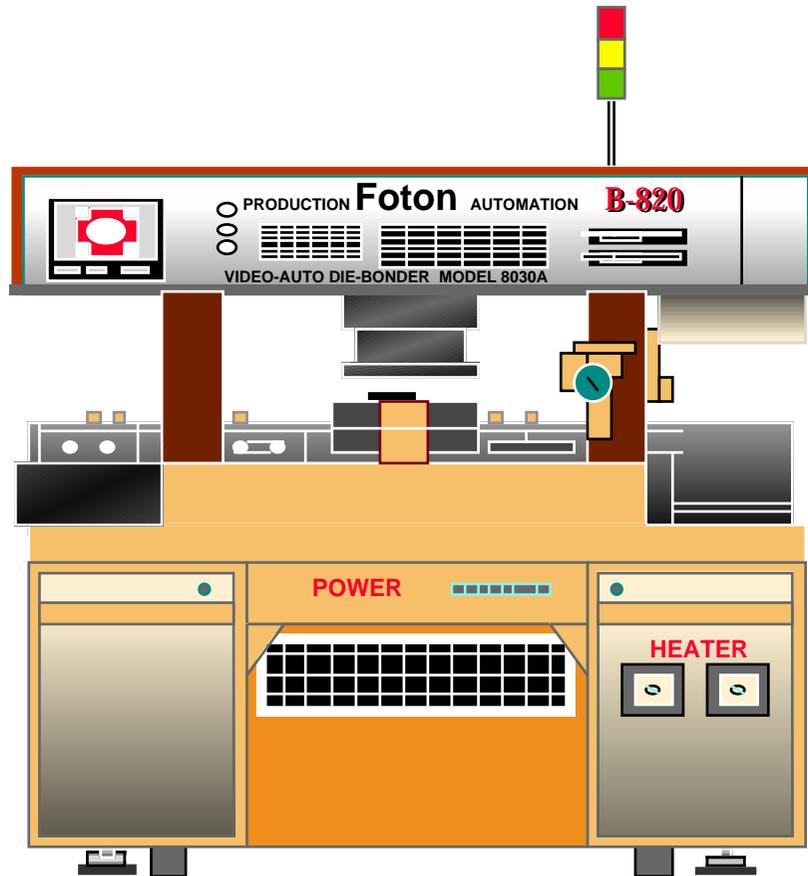
### Definition of T.P.M. :

T.P.M. IS: A PRODUCTIVE MANUFACTURING SYSTEM with the TOTAL Participation of: Managers, Supervisors, Engineers, Technicians and Operators.

T.P.M. Includes the Following Benefits:

- Maximize Overall Equipment Effectiveness
- Establishment a Complete System of Maintenance for the Machine Entire Life
- Create a Better Work Environment, Promoting the Participation for All Employees

# T.P.M. = Medical Science of Equipment

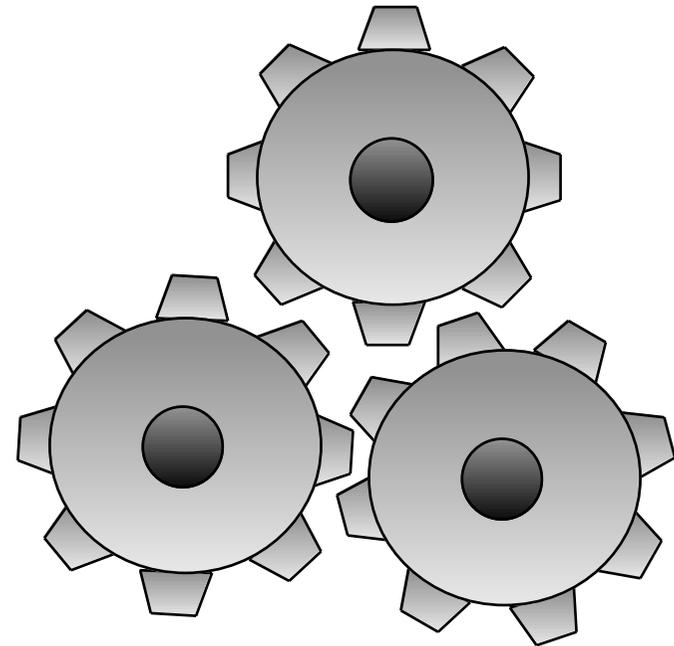


**The Main objective of TPM is :**  
**Zero Interruptions**  
**Zero Defects**  
**Zero Accidents**

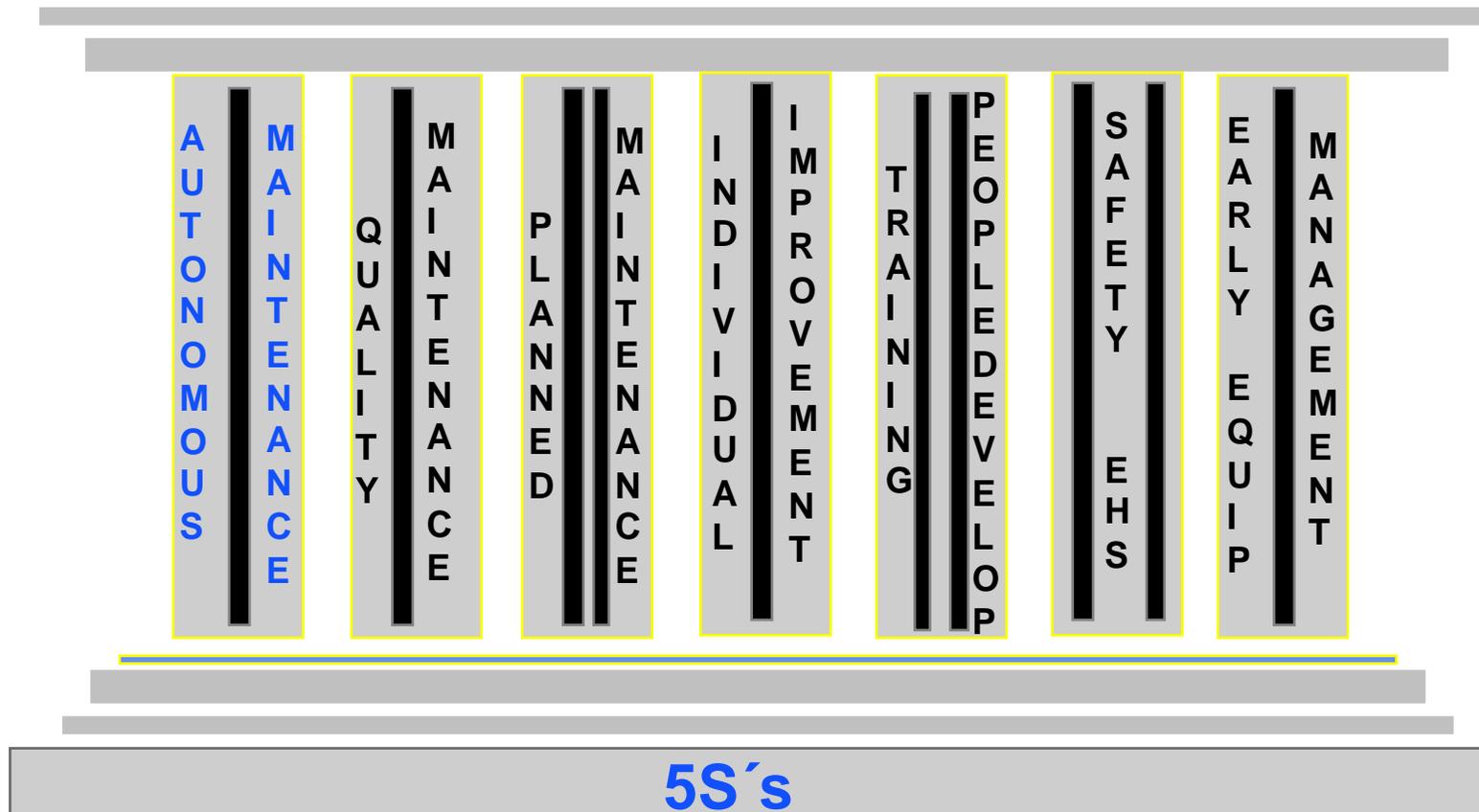
Throughout total employees participation from Top Management to Operators,  
based in the following activities:

**Autonomous Maintenance**

- Planned Maintenance
- Individual Improvement
- Quality Maintenance
- Early Equipment Management
- Education/Training (People Development)
- Safety



# PILLARS OF TPM



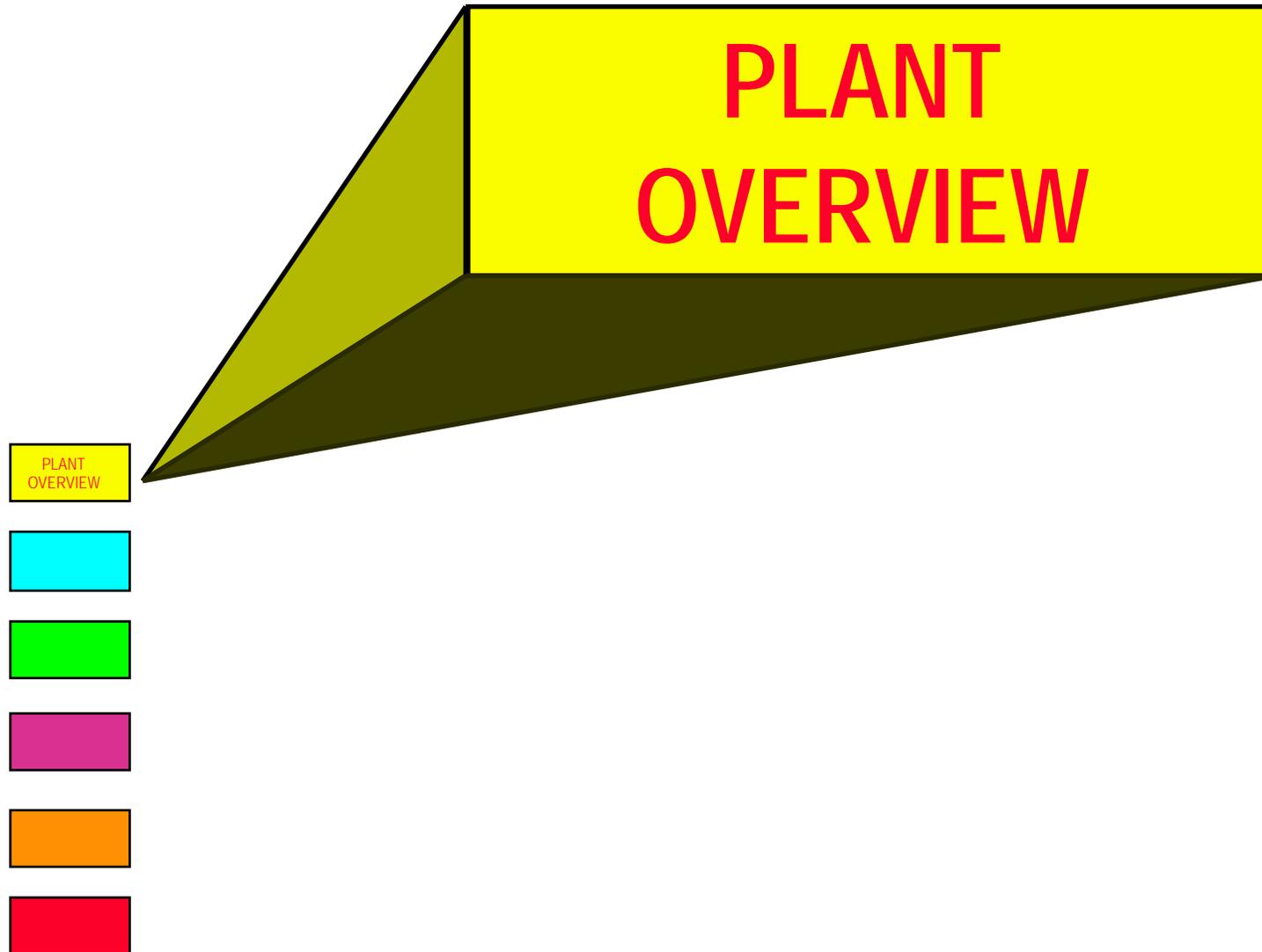
# T.P.M.

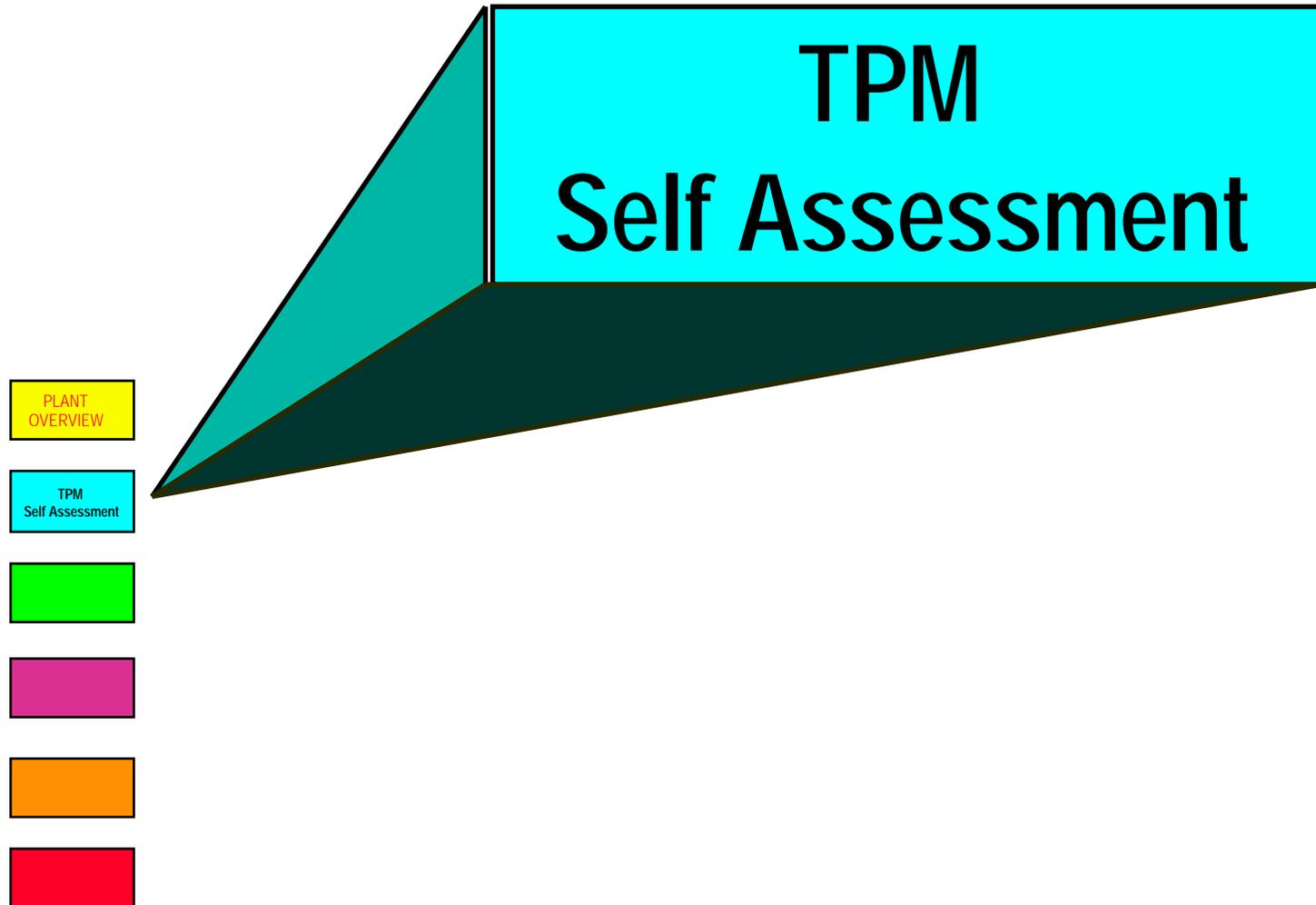
## Total Productive Manufacturing

People , Equipment and Product  
Improvement by Working Together.



Courtesy, in part, of Motorola SPS.  
Thank You!





# TPM Self Assessment

## Background:

**1991** First attempt to implement TPM.

TPM consultant provides training to selected Managers, Supervisors and Engineers.

One coordinator with experience in Process and Maintenance is assigned to lead TPM.

Literature and materials, prepared and distributed.

⇒ **Lack of support and involvement results on failing the implementation.**

# TPM Self Assessment

**1996**

One Staff Mgr. is assigned to lead the TPM Implementation plant wide.

A core team is formed on **2Q/96** with key people from different departments to coordinate the implementation.

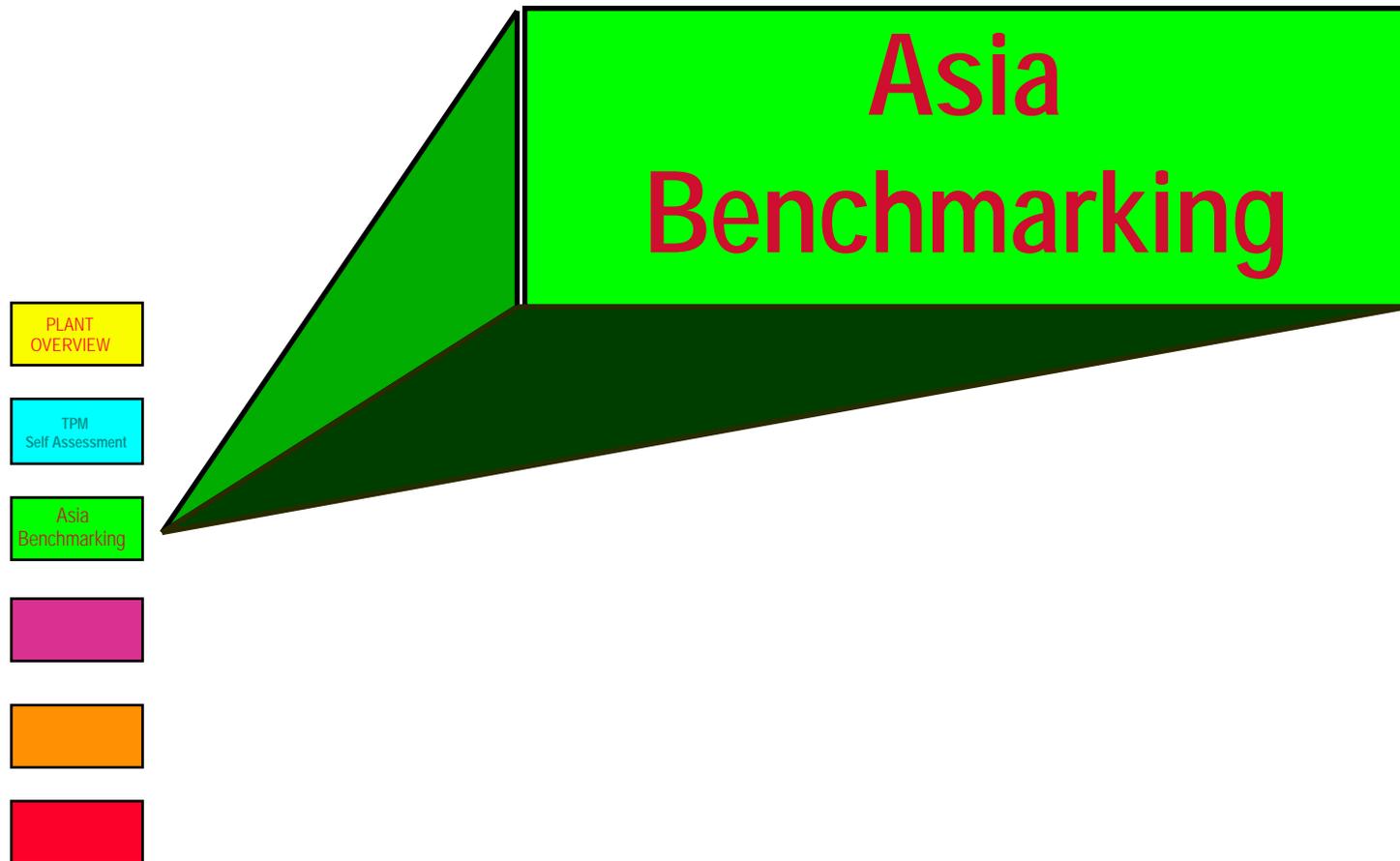
Model equipment is selected based on bottle neck operation.

Equipment conditions analysis performed.

Most of the teams cover the initial cleaning.

Activities are focused on six big losses detected and 5 S's implementation.

Courtesy, in part, of Motorola SPS.  
Thank You!



## TPM Benchmarking Asia Facilities

1996

Facility 1	April
Facility 2	May
Facility 3	June

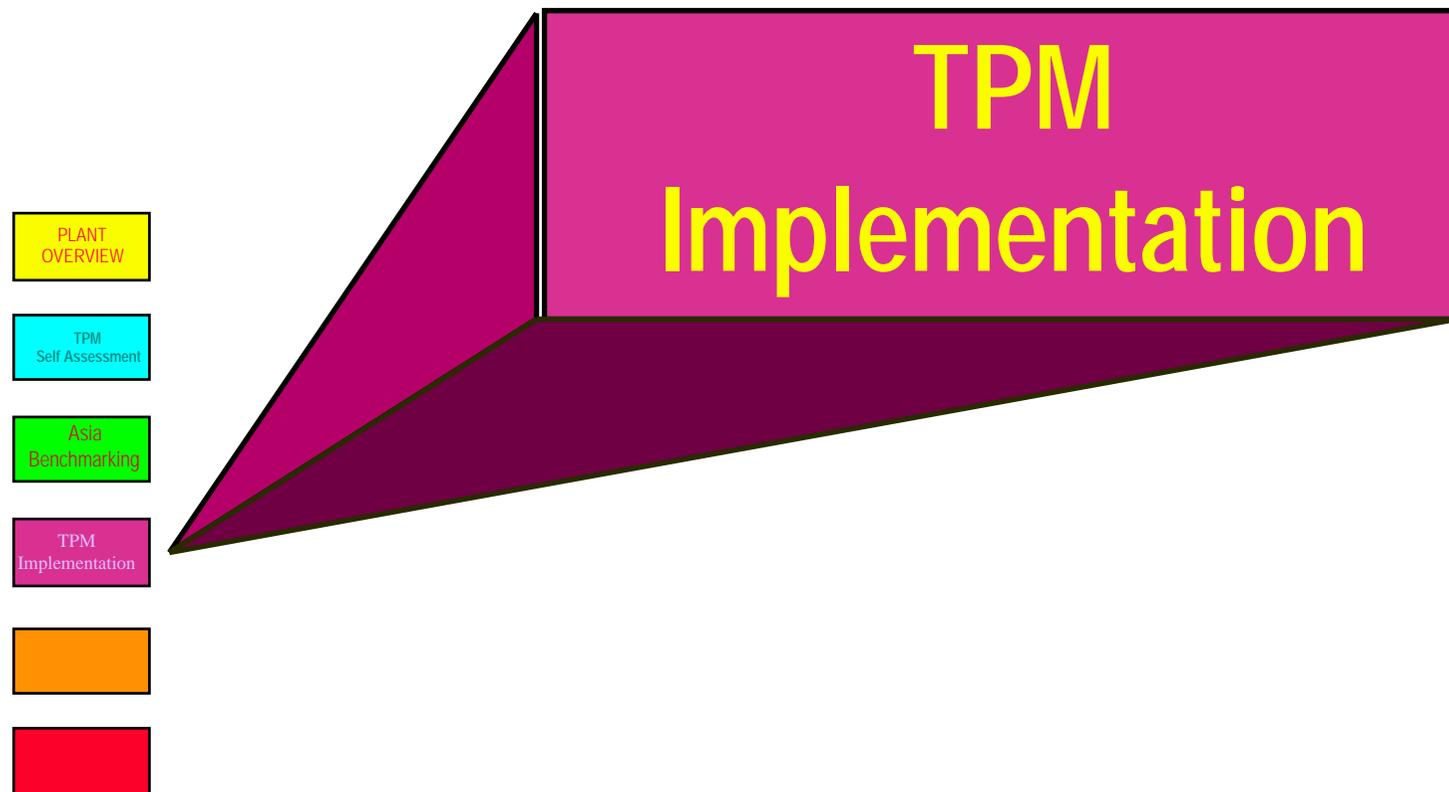
**Committee:** 4 Chosen Folks

**Objective:** Learn from Asia success experiences in TPM implementation and come up with directions for Plant implementation.

# Benchmarking Conclusions

- Total management involvement.
- T.P.M. Manager (dedicated).
- A well defined implementation process.
- Provide people with time to work on it. ( 4- 6 Hr./wk ).
- Each staff has their own T.P.M. Promoter full time.
- Focused in Consultant X model.
- Focused in just one product line per area.
- Budget assigned for consulting and external training.

Courtesy, in part, of Motorola SPS.  
Thank You!

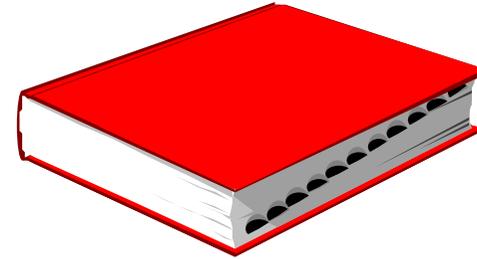


# IMPLEMENTATION/CONSULTANT

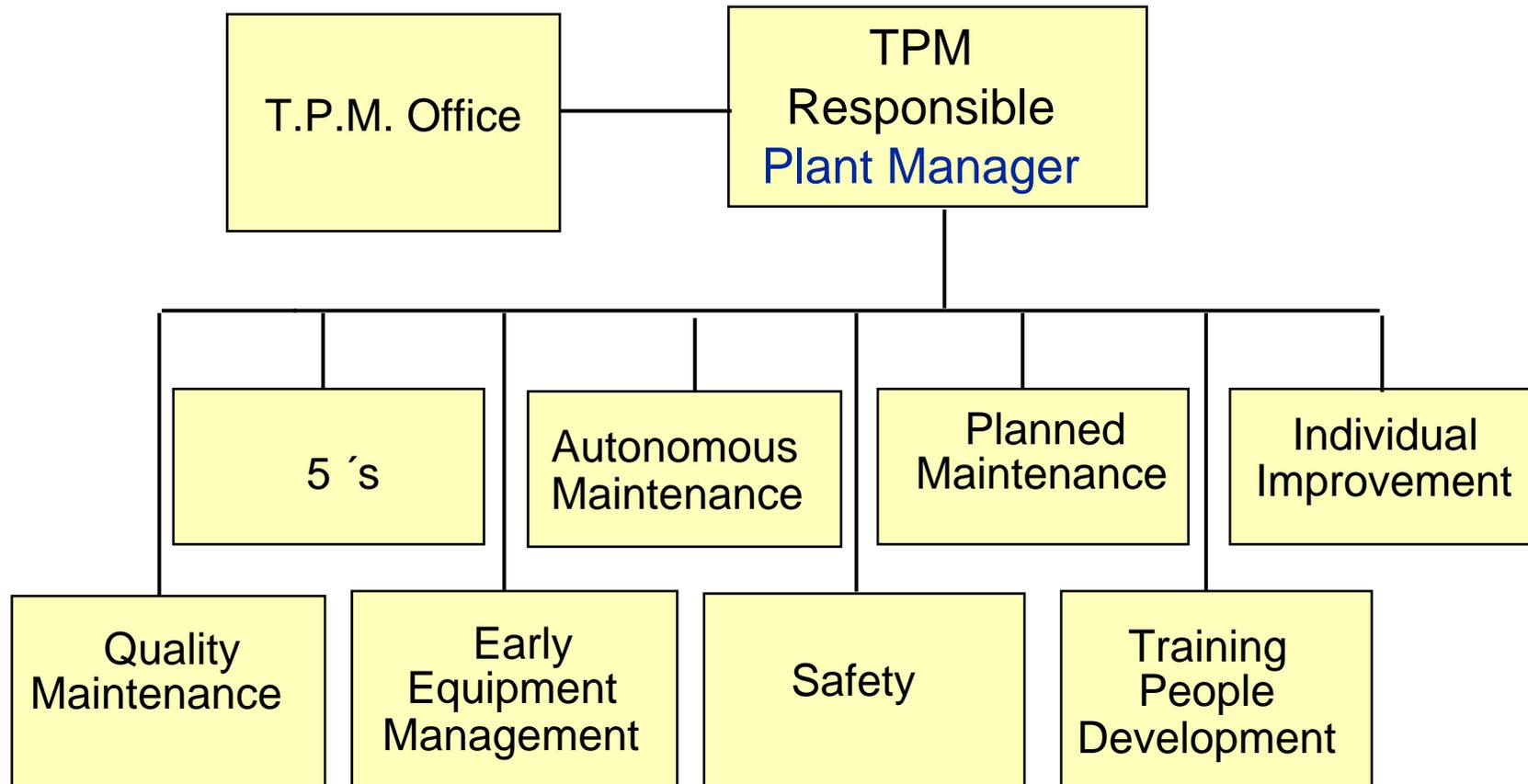
- \* Q3 1996, **Consultant X** is selected to be Consultant.
- \* Training of Managers, Team leaders and Team members
- \* Master Plan Defined
- \* TPM. implementation initiated according to Consultant X recommendations

## T.P.M. POLICY

- # ESTABLISH AN INTEGRATED STRUCTURE TO PROMOTE T.P.M. AS A COMPANY CULTURE.
- # MAXIMIZE OVERALL EQUIPMENT EFFECTIVENESS
- # TOTAL EMPLOYEE INVOLVEMENT.
- # CULTIVATE EQUIPMENT & PROCESS RELATED EXPERTISE THROUGHOUT SHOP FLOOR. ( Autonomous Maintenance, Planned Maintenance etc..)
- # ESTABLISH A RELIABILITY AND MAINTAINABILITY SYSTEM TO MAXIMIZE EQUIPMENT LIFE TIME. (Planned Maintenance Autonomous Maintenance, Individual Improvement, Early Equipment Management.)
- # ALL EMPLOYEES MUST PARTICIPATE IN T.P.M TRAINING PROGRAM.
- # ALL AREAS MUST FOLLOW T.P.M. ESTABLISHED GUIDE LINES.
- # DEPARTMENT HEAD IS RESPONSIBLE TO ACCOMPLISH AND SUPPORT T.P.M. GOALS.

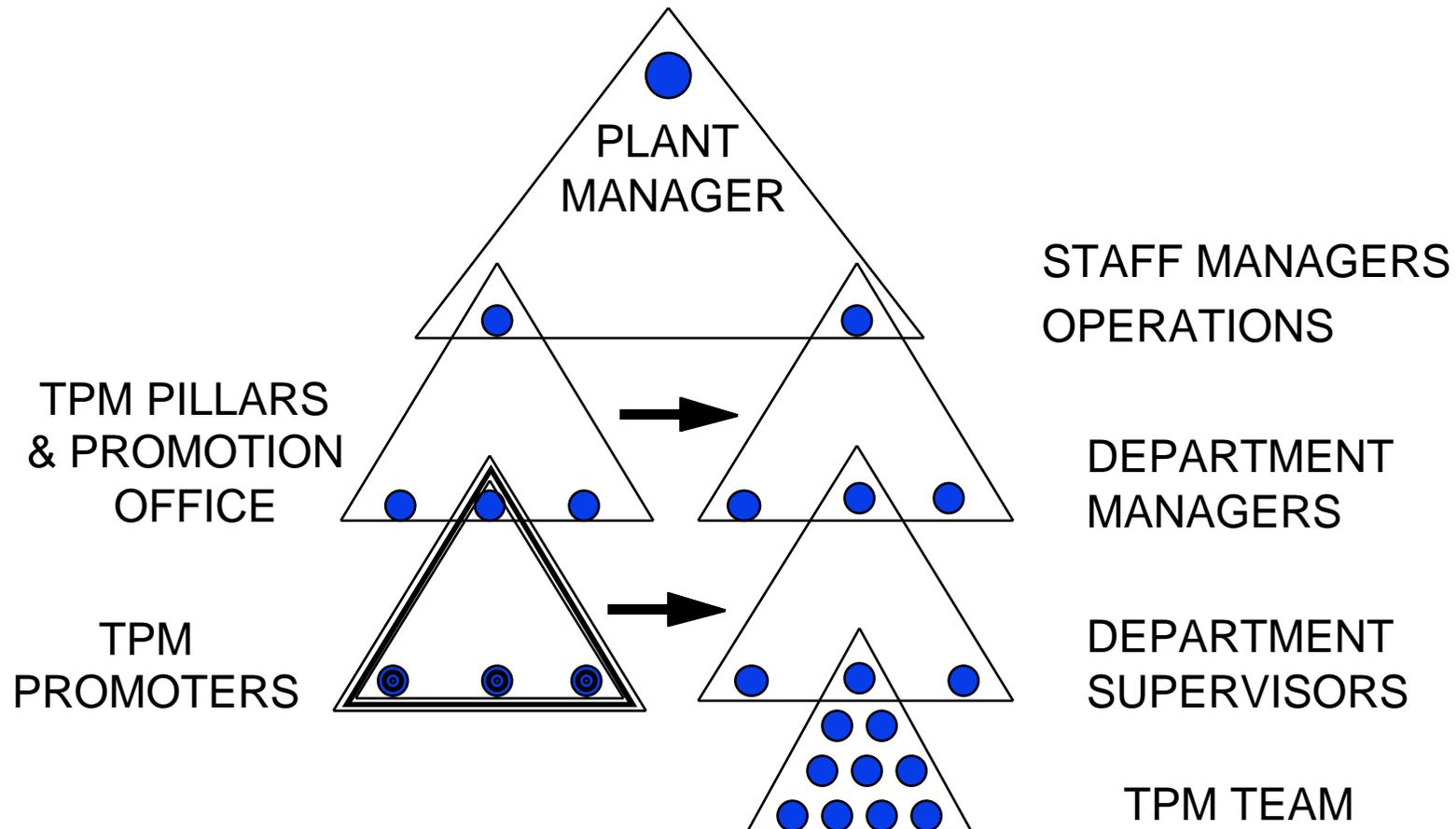


# T.P.M. PLANT WIDE STRUCTURE

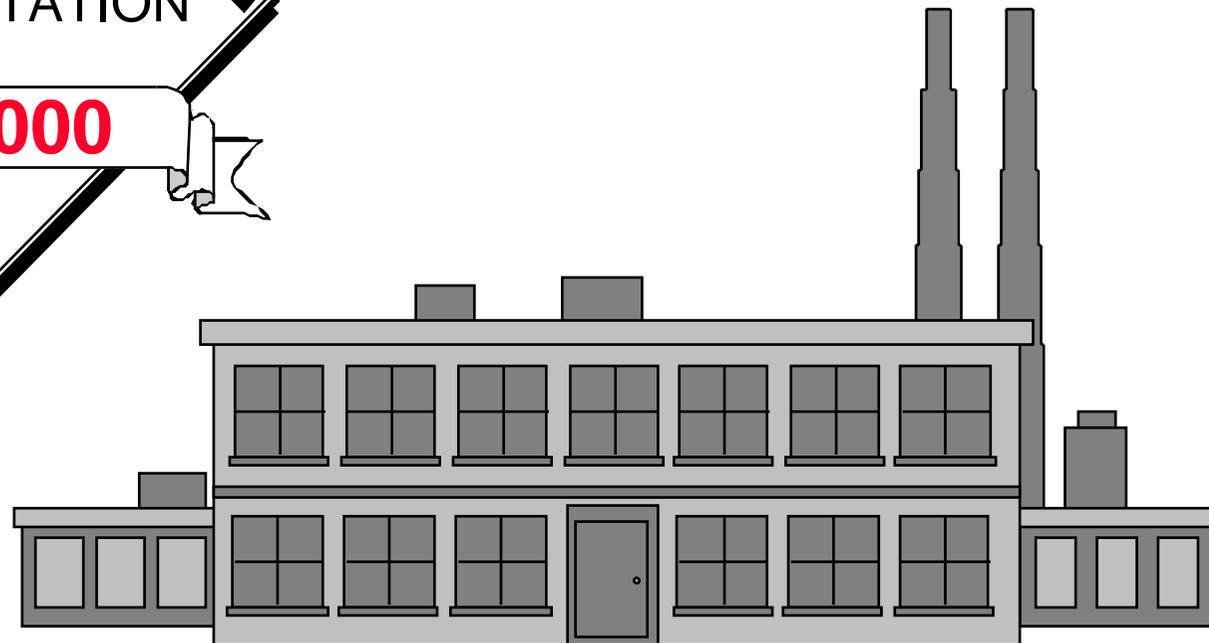
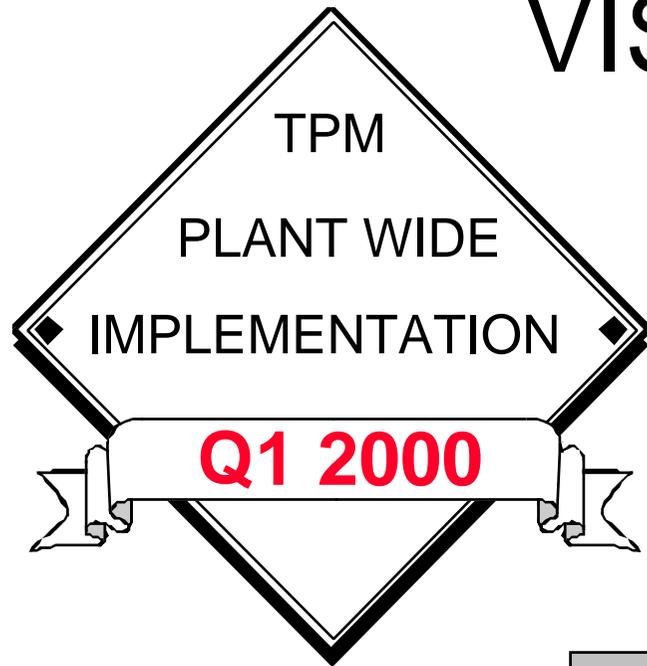


# PROMOTION STRUCTURE

(OVERLAPPING SMALL GROUPS)



# VISION STATEMENT:



# T.P.M. IMPLEMENTATION ACTIVITIES

## MANAGER TEAMS



## **PREPARATION / PLANNING STAGE**

# DEFINE PILOT LINES

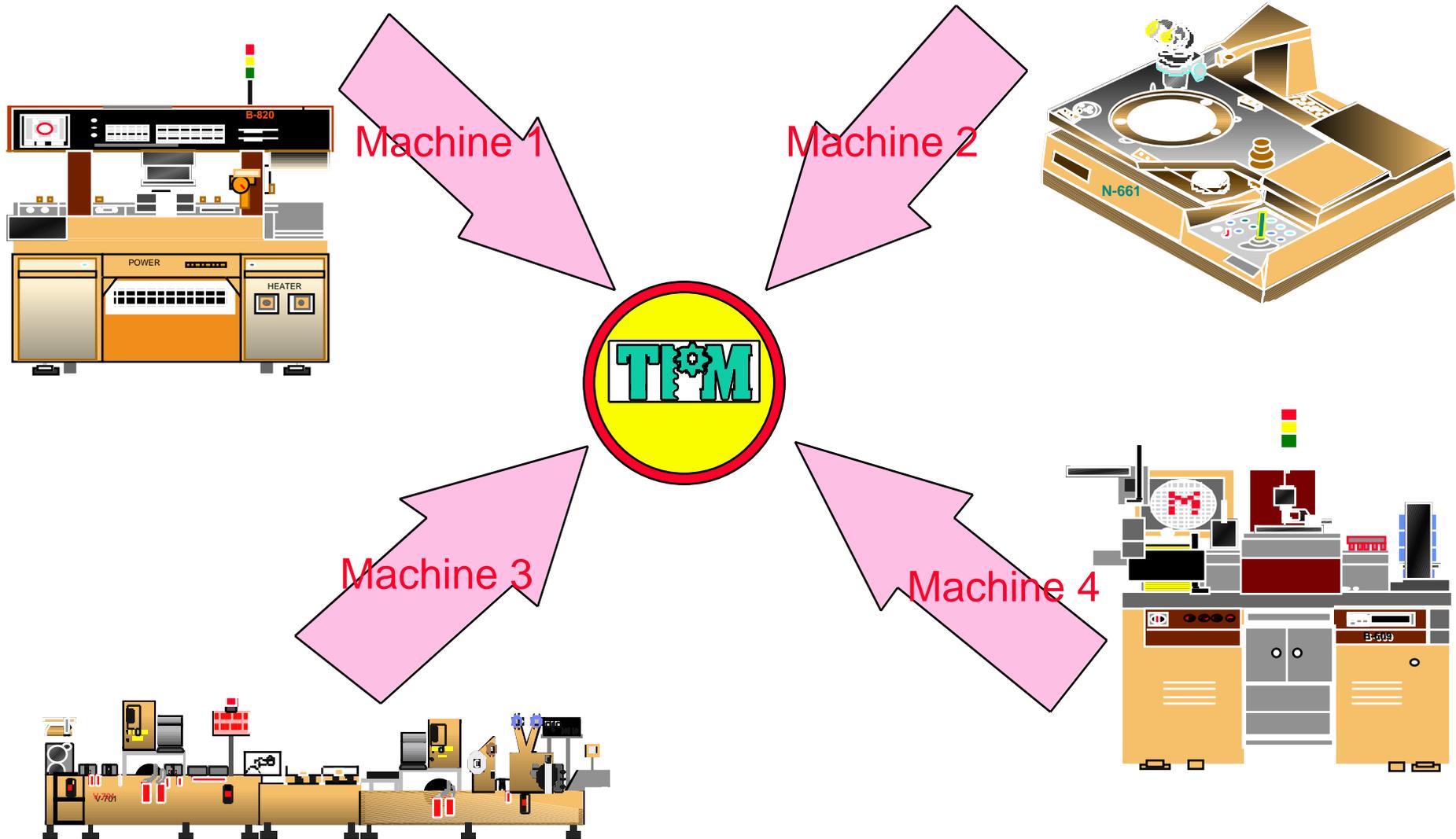
# AMOUNT OF MACHINES INCLUDED PER LINE

# DEFINE CORE TEAM MEMBERS OF EACH LINE

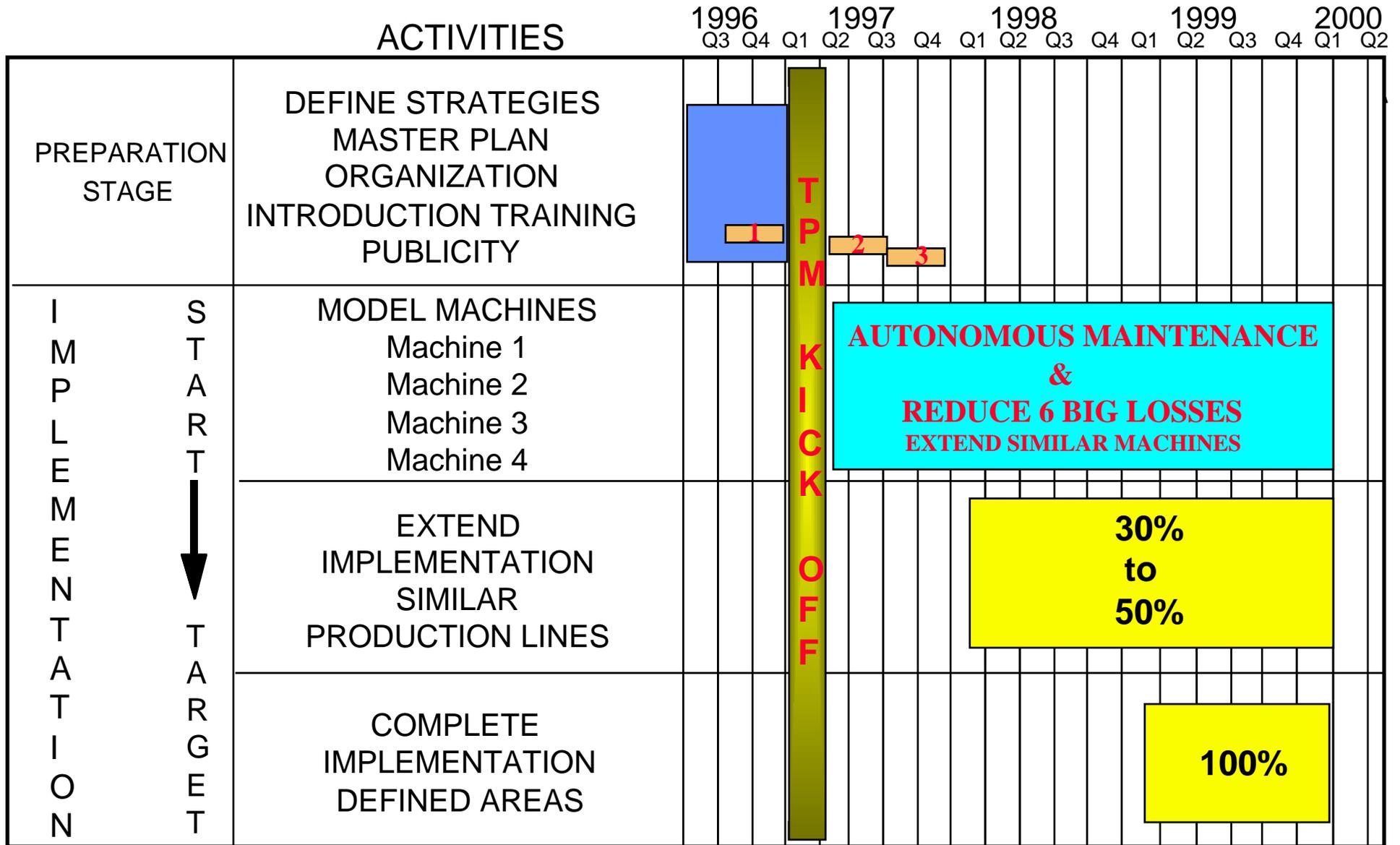
# SELECT TEAM MEMBERS PER MACHINE

# START ACTIVITIES IN PILOT MACHINES (bottle neck.)

# Line and Machine Selection

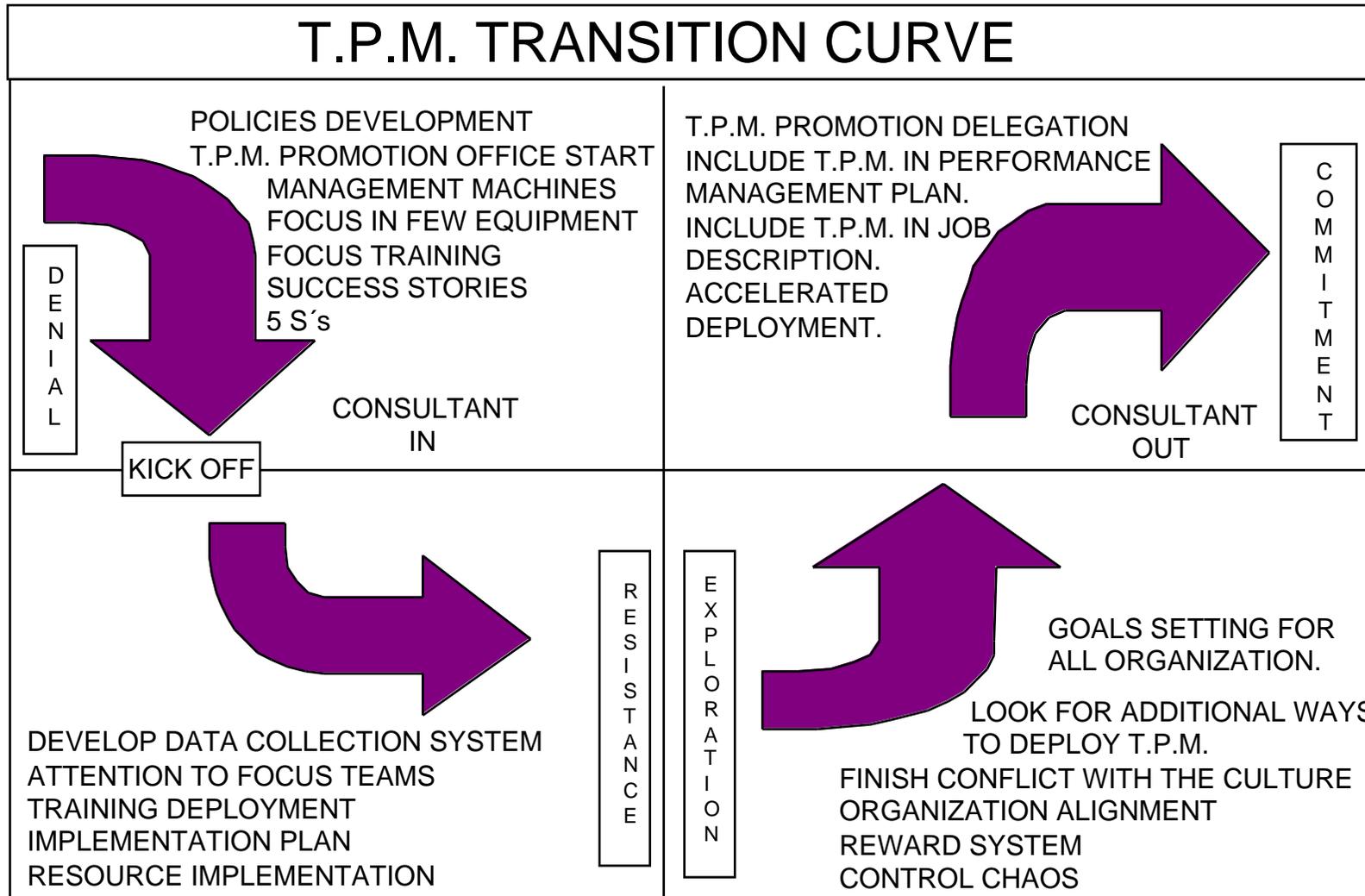


# TPM Implementation Plan



T  
P  
M  
  
K  
I  
C  
K  
  
O  
F  
F





# KEY GOALS

1.- TOTAL EQUIPMENT EFFECTIVENESS	%	85
A) Equipment Breakdown	HOURS/MONTH	1/10
B) M.T.B.A.	MINUTES	1x10x
C) M.T.B.F.	HOURS	1x2x
2.- REJECT CAUSED BY LINE EQUIPMENT	PPM	1/5
3.- LINE REJECT RATE	%	1/5
4.- CYCLE TIME	DAYS	0.8X
5.- FATAL ERROR AT CUSTOMER	# OF	0
6.- ON TIME DELIVERED	%	98
7.- MANUFACTURING COST	USD	20% LESS
8.- LABOR PRODUCTIVITY	K.UNITS /# OF D/L	2X

# AUTONOMOUS MAINTENANCE.



## MANUFACTURING SPECIALIST



## **AUTONOMOUS MAINTENANCE IS:**

Maintenance performed by equipment operators.

### THE FIRST 3 STEPS OF AUTONOMOUS MAINTENANCE.

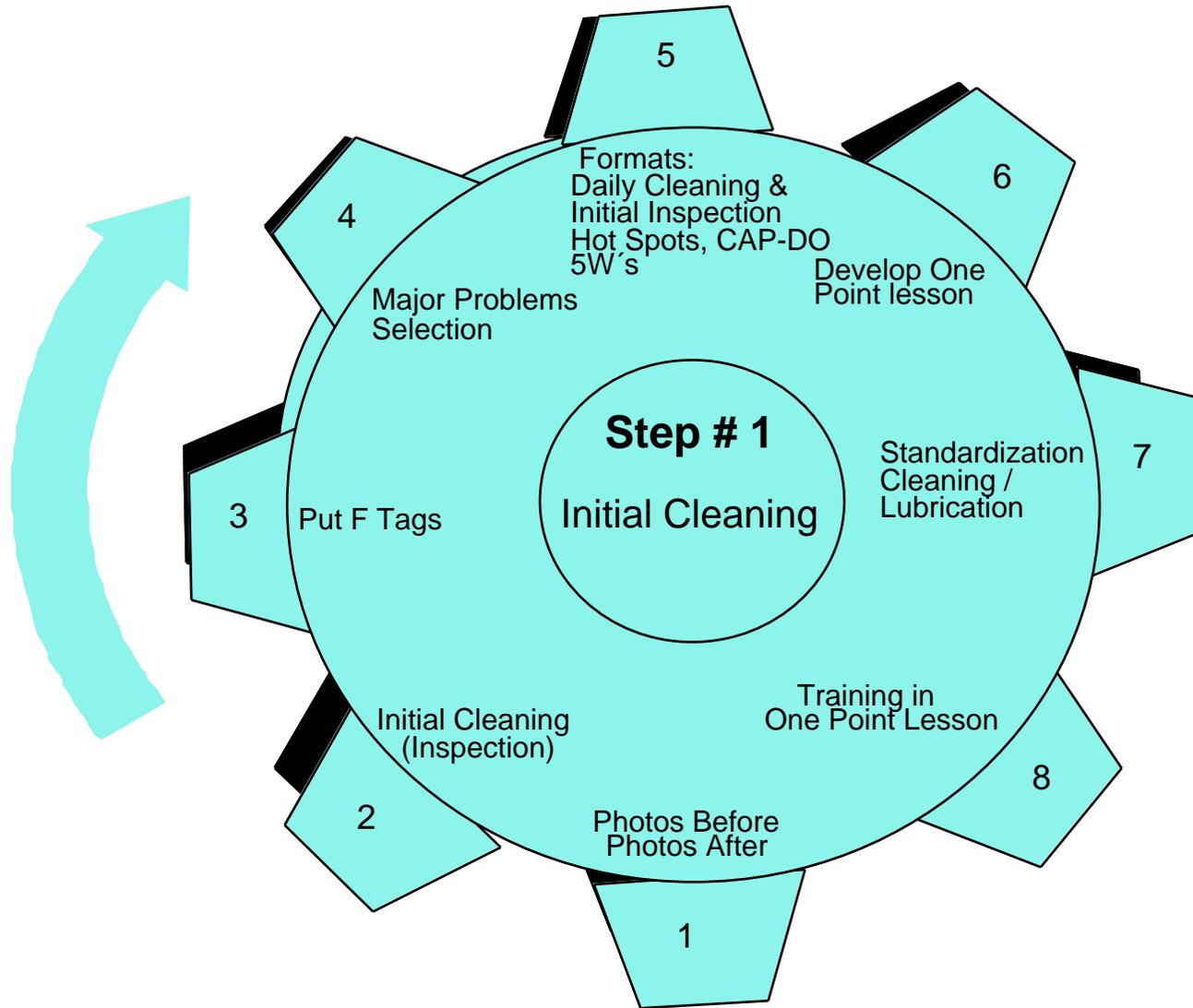
STEP # 1 INITIAL CLEANING.

STEP # 2 COUNTERMEASURES FOR THE CAUSES  
OF FORCED DETERIORATION AND IMPROVING  
HARD-TO-ACCESS AREAS.

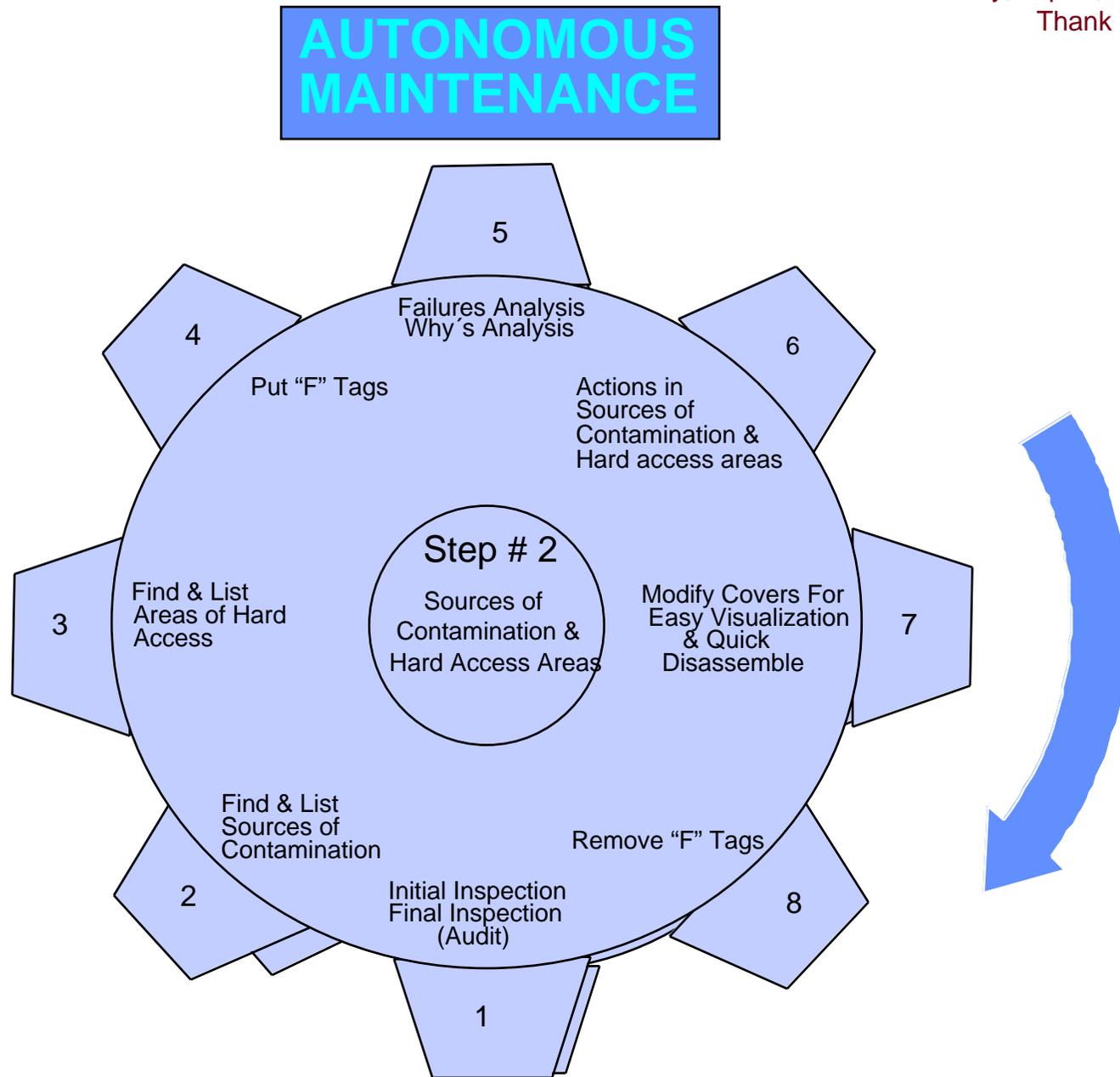
STEP # 3 MAKING A TENTATIVE CLEANING/  
LUBRICATION STANDARD.

Courtesy, in part, of Motorola SPS.  
Thank You!

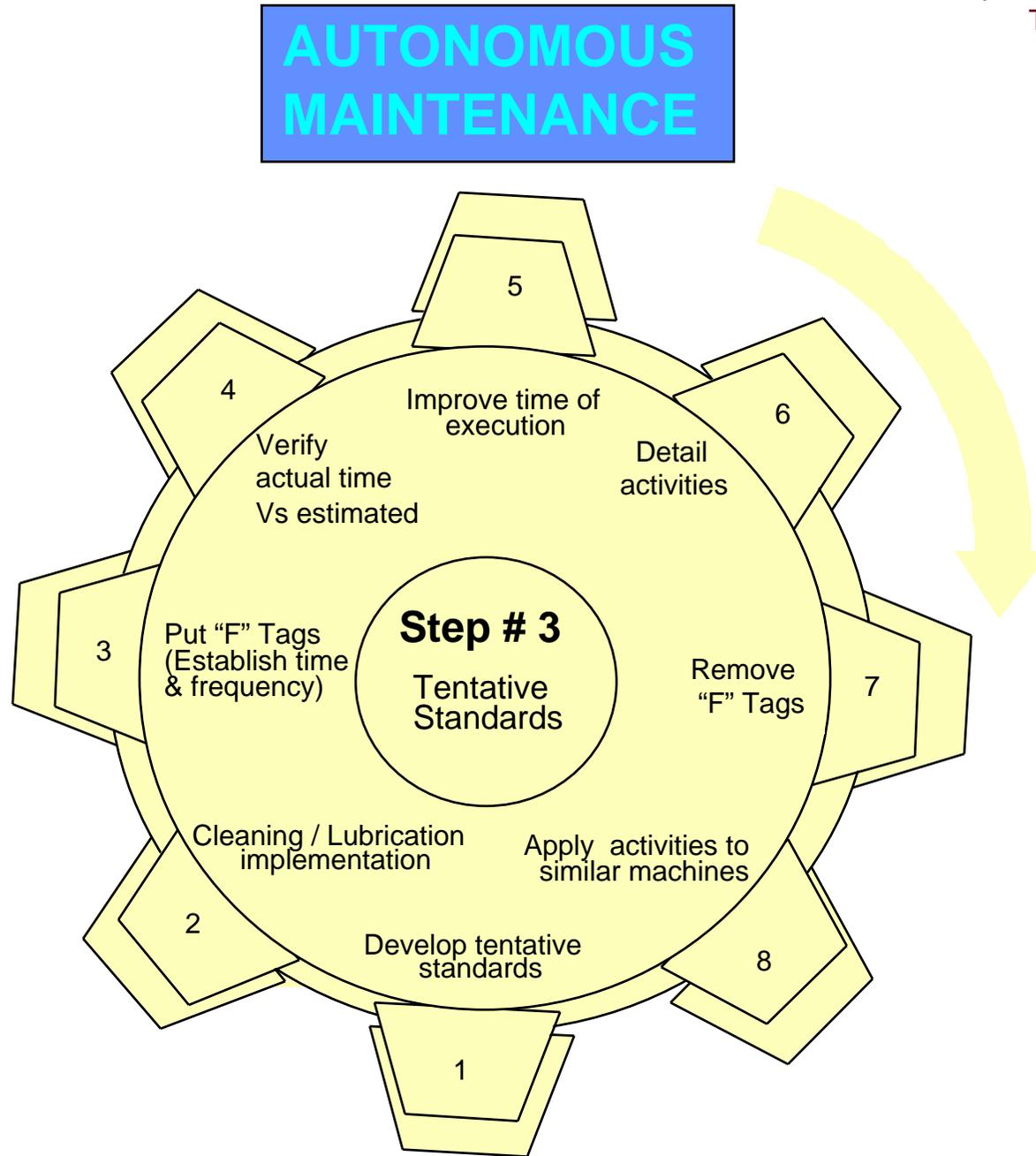
# AUTONOMOUS MAINTENANCE



Courtesy, in part, of Motorola SPS.  
Thank You!



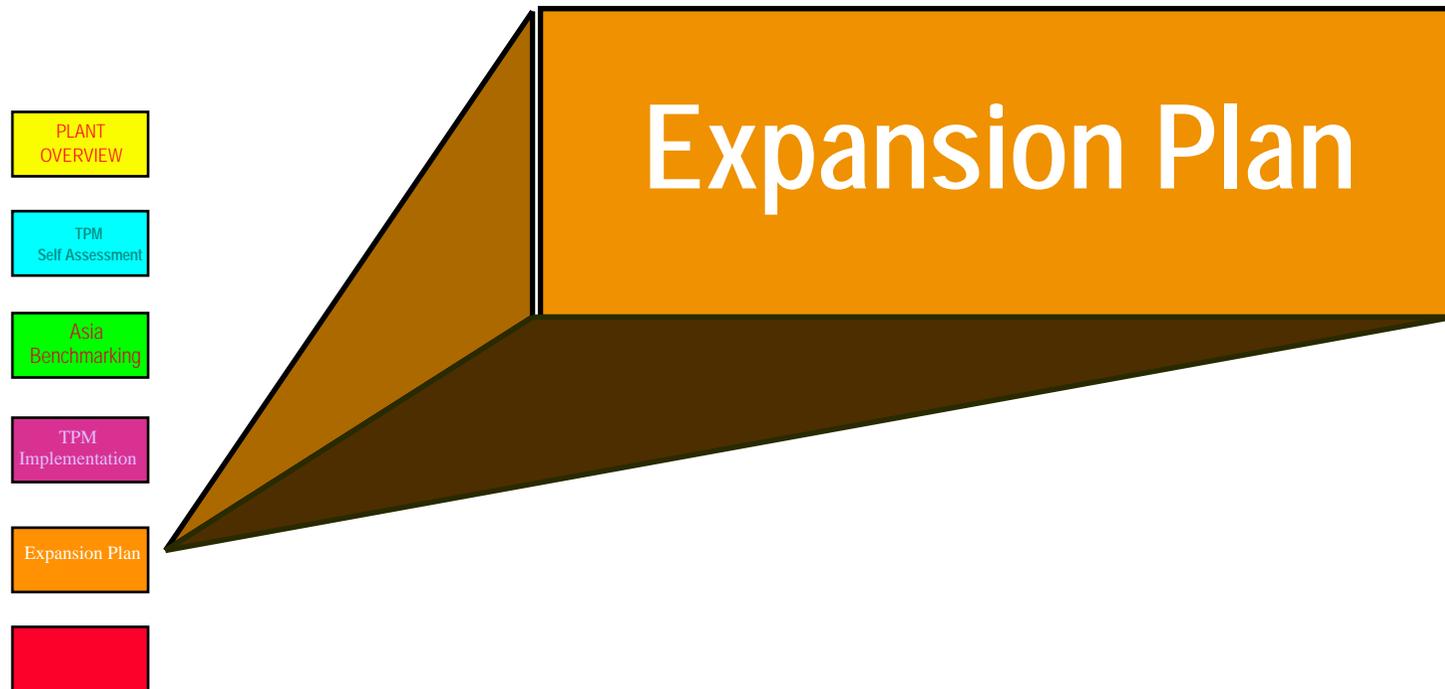
Courtesy, in part, of Motorola SPS.  
Thank You!



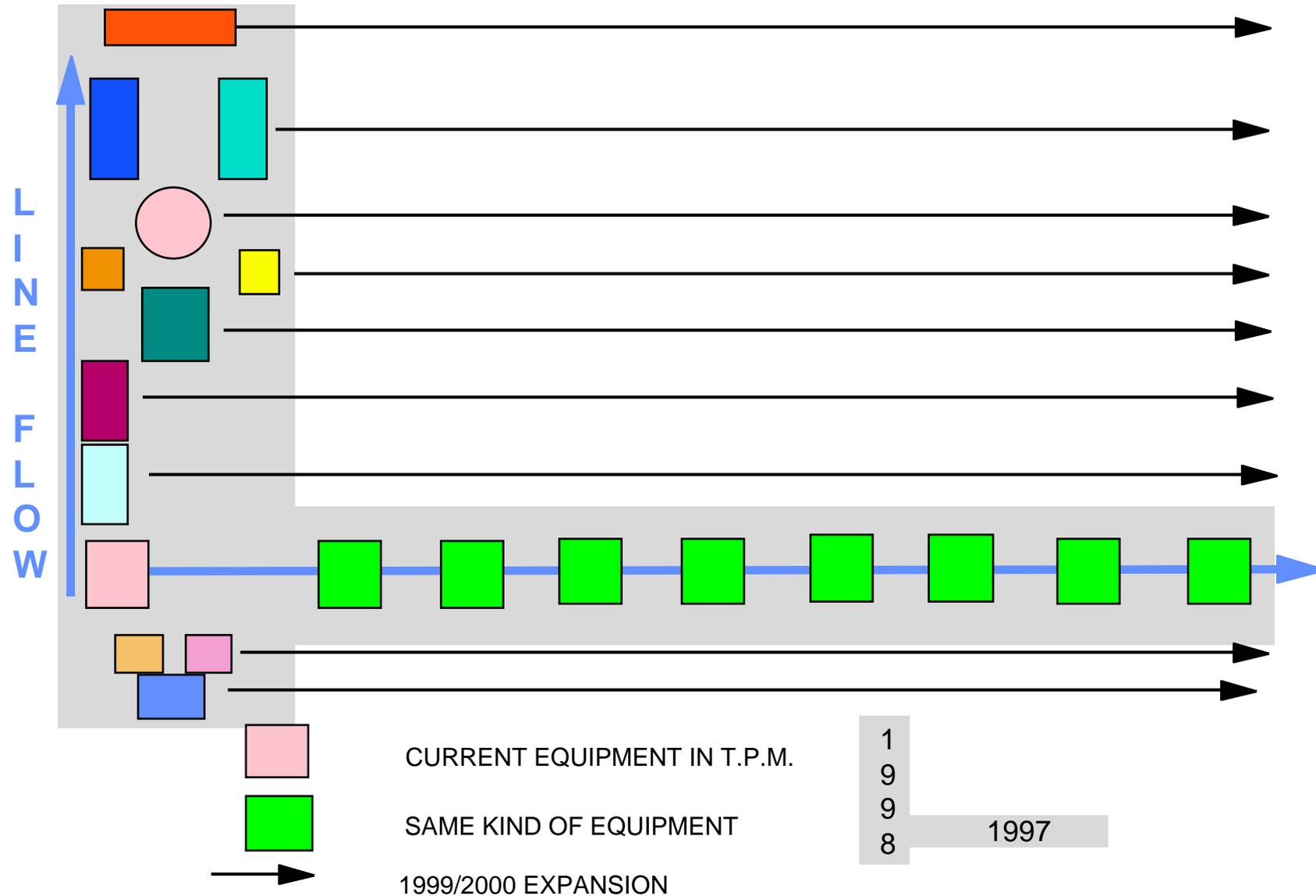
## TPM Teams Status

October 1997

•Number of Hot Spots detected:	284
•Number of Hot Spots solved:	126
•One Point Lesson developed:	44
•One Point Lesson Taught:	34
•Number of teams on TPM:	27
•Teams on step 3:	1
•Teams on step 2:	2
•Teams on step 1:	24

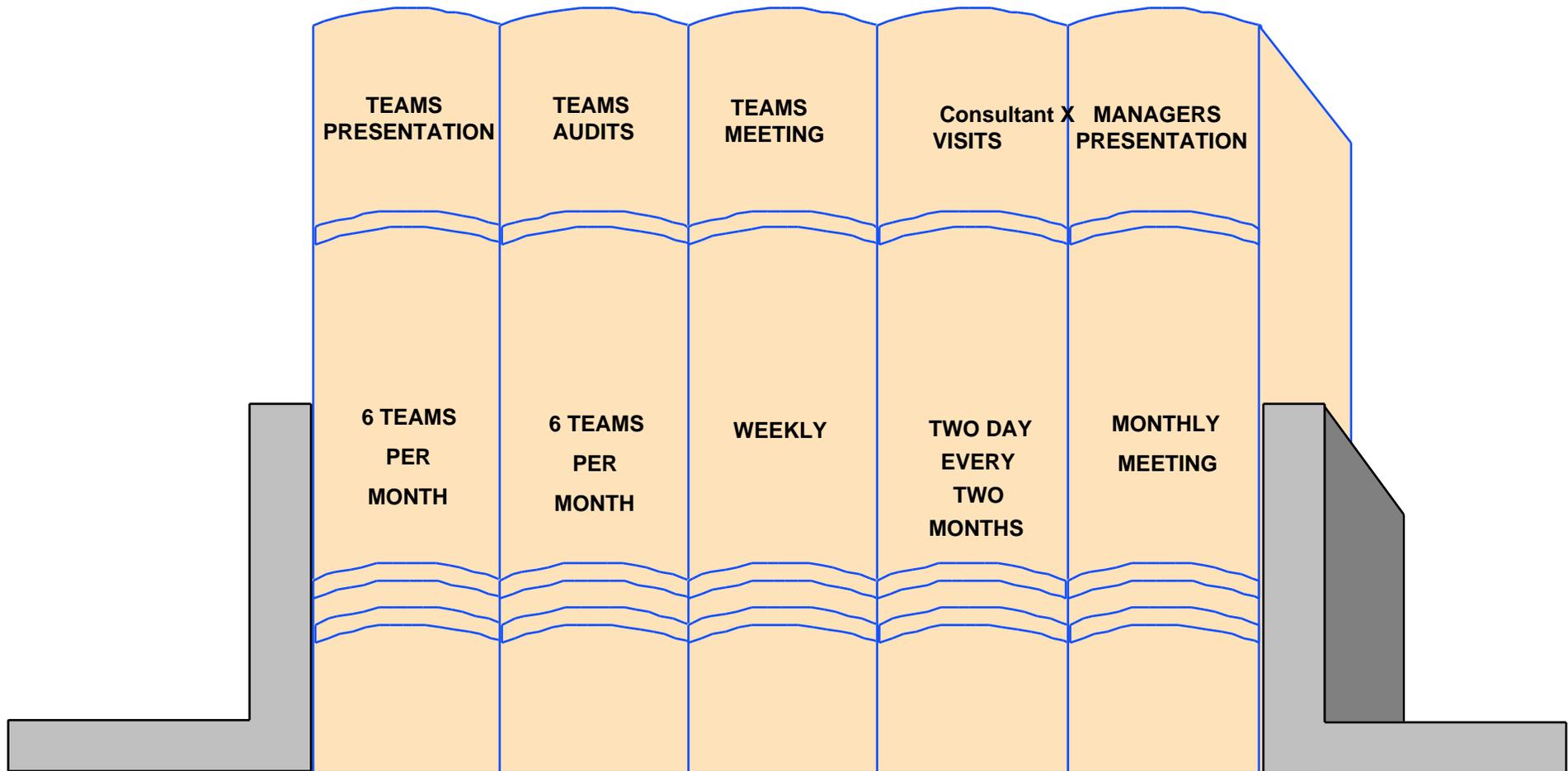


# T.P.M. DEPLOYMENT

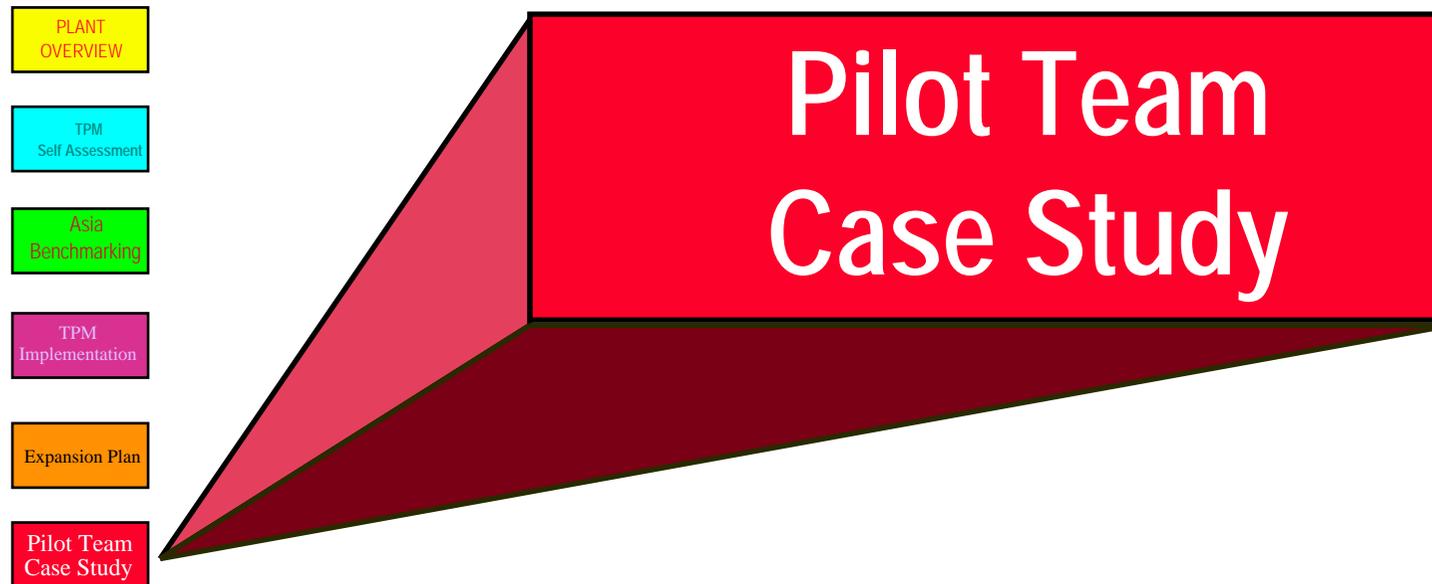


<b>PROJECTED PROGRESS IN TEAMS Q-1' 98</b>			
<b>Line</b>	<b>A.M. STEP # 1</b>	<b>A.M. STEP # 2</b>	<b>A.M. STEP # 3</b>
<b>Line 1</b>	<b>11</b>	<b>16</b>	<b>03</b>
<b>Line 2</b>	<b>03</b>	<b>11</b>	<b>01</b>
<b>Line 3</b>	<b>03</b>	<b>08</b>	<b>01</b>
<b>Line 4</b>	<b>04</b>	<b>01</b>	<b>01</b>

# T.P.M. FOLLOW-UP

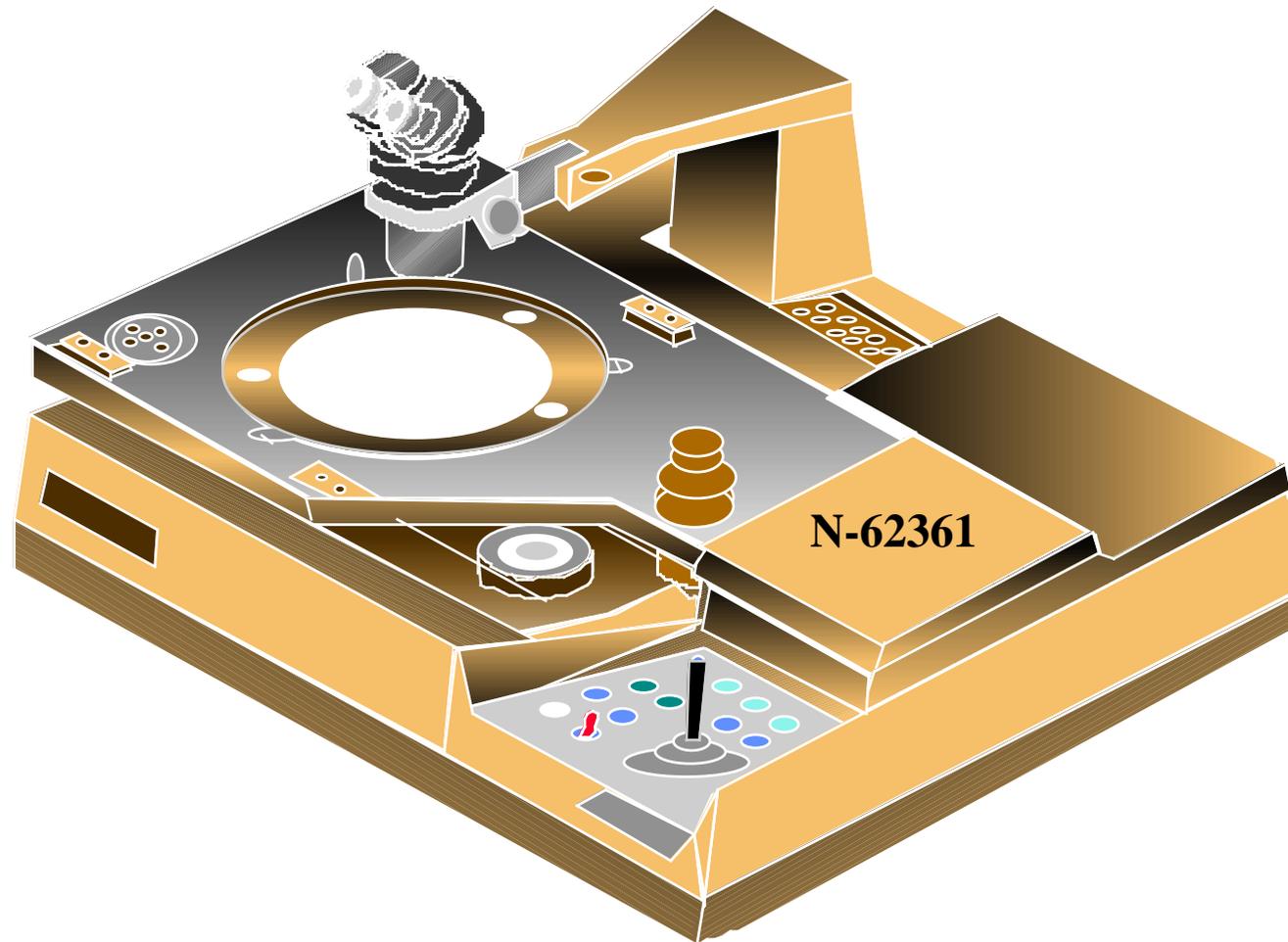


Courtesy, in part, of Motorola SPS.  
Thank You!

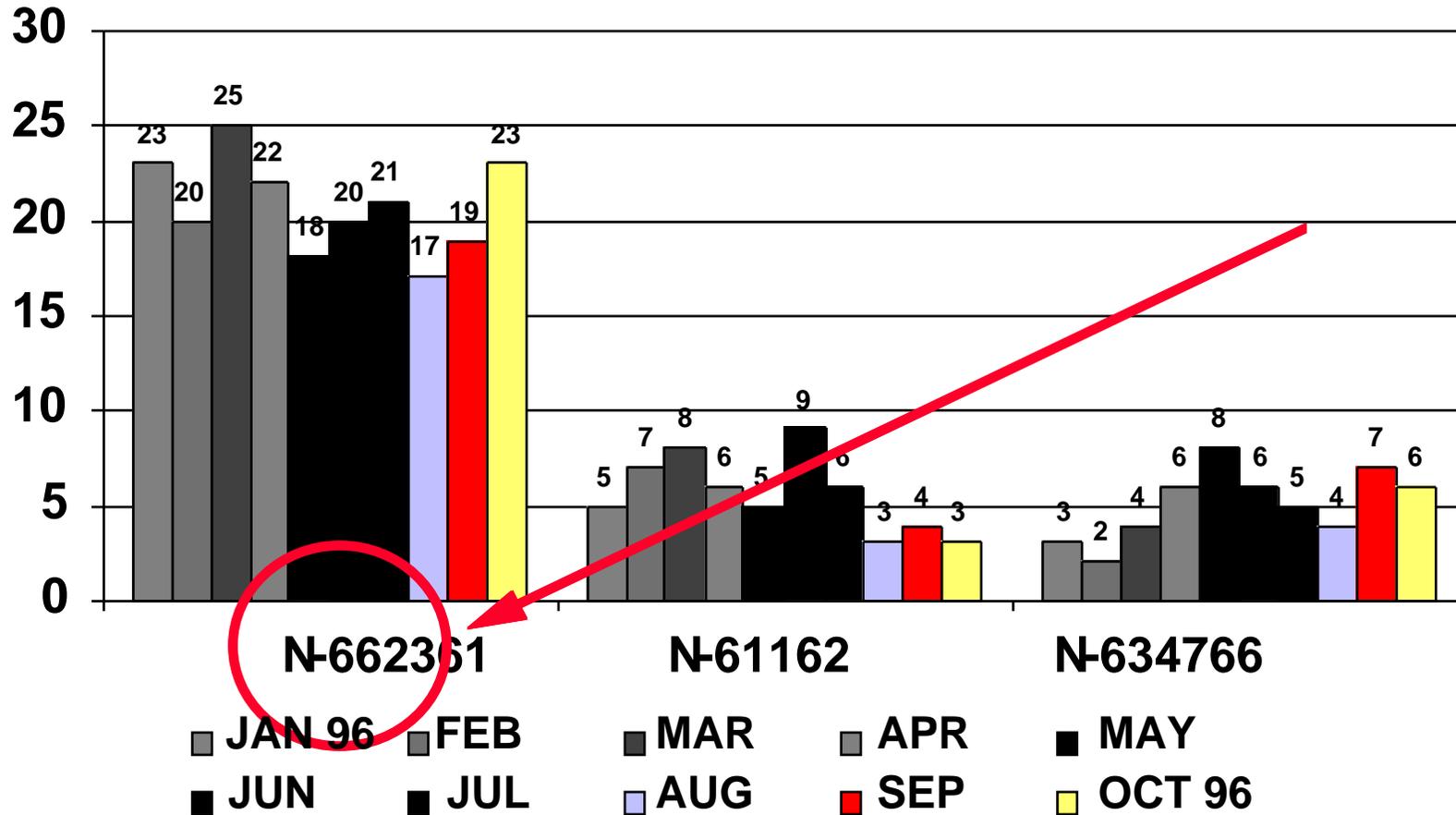


Courtesy, in part, of Motorola SPS.  
Thank You!

# PILOT MACHINE

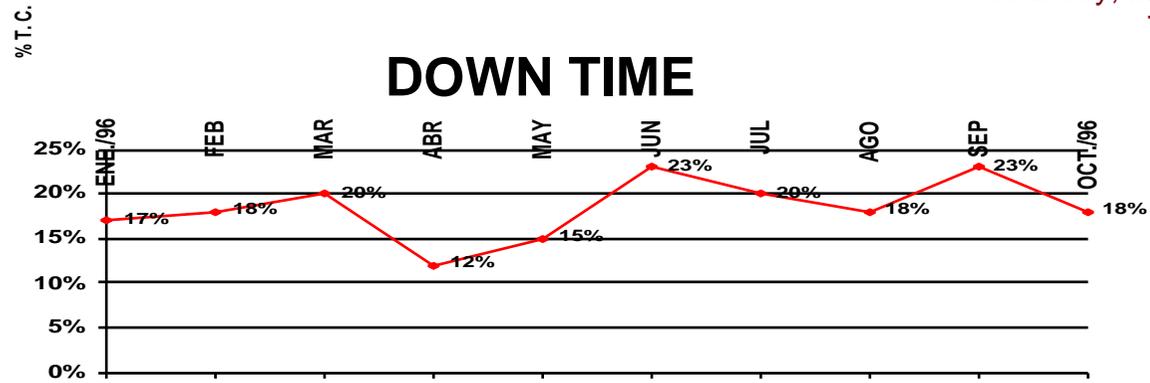


## Defectives

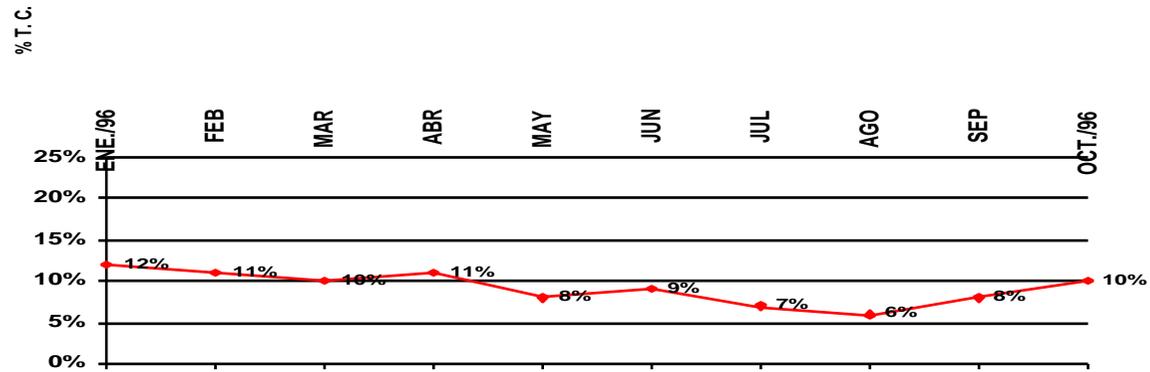


Courtesy, in part, of Motorola SPS.  
Thank You!

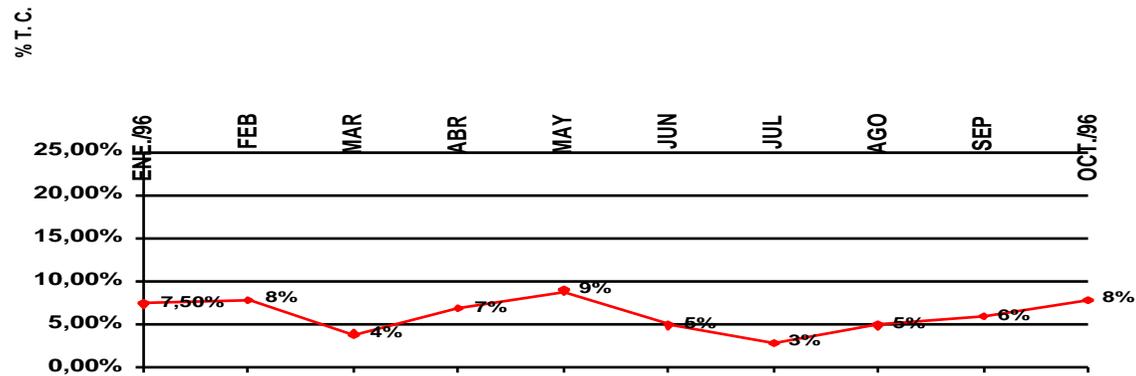
N-662361



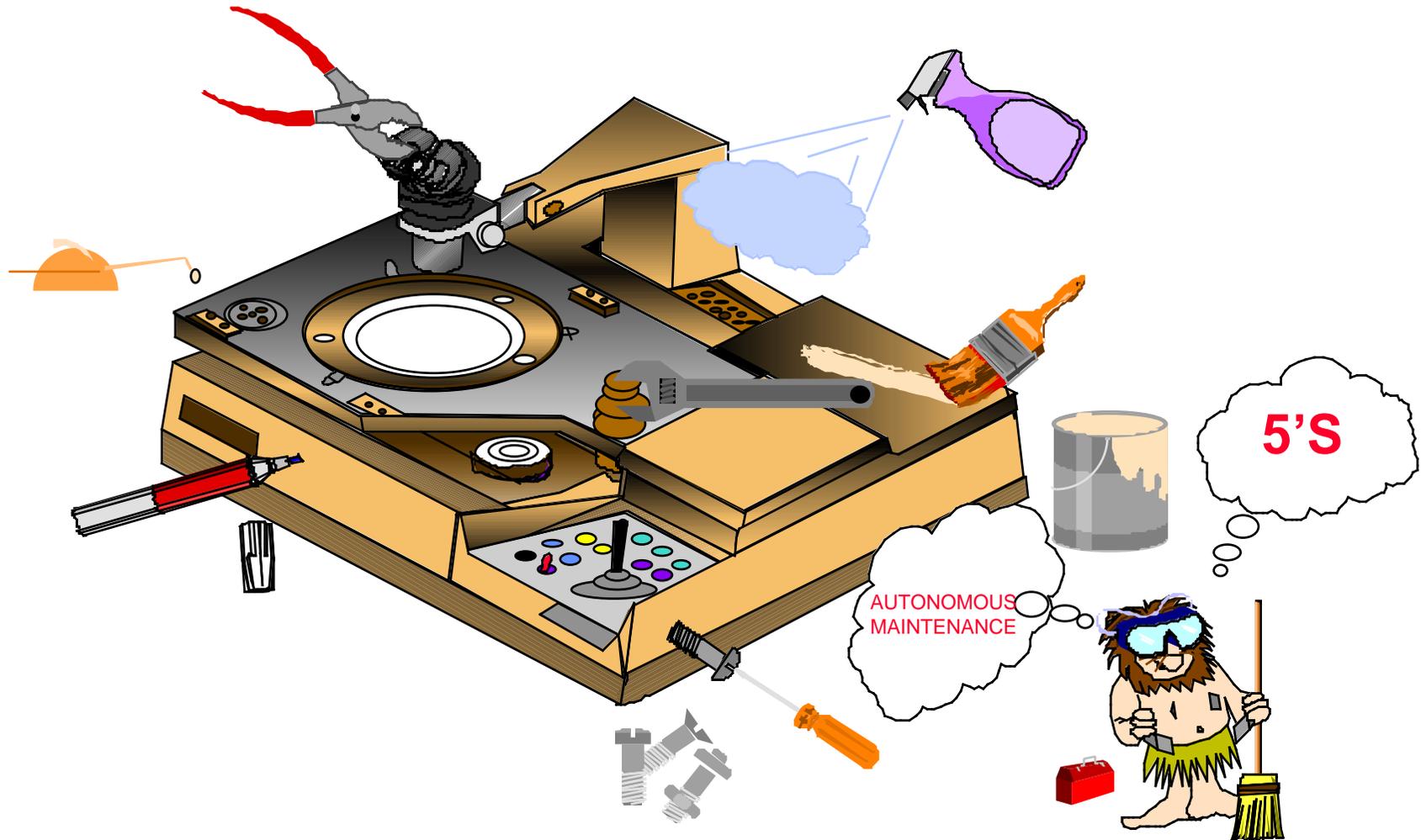
N-663242



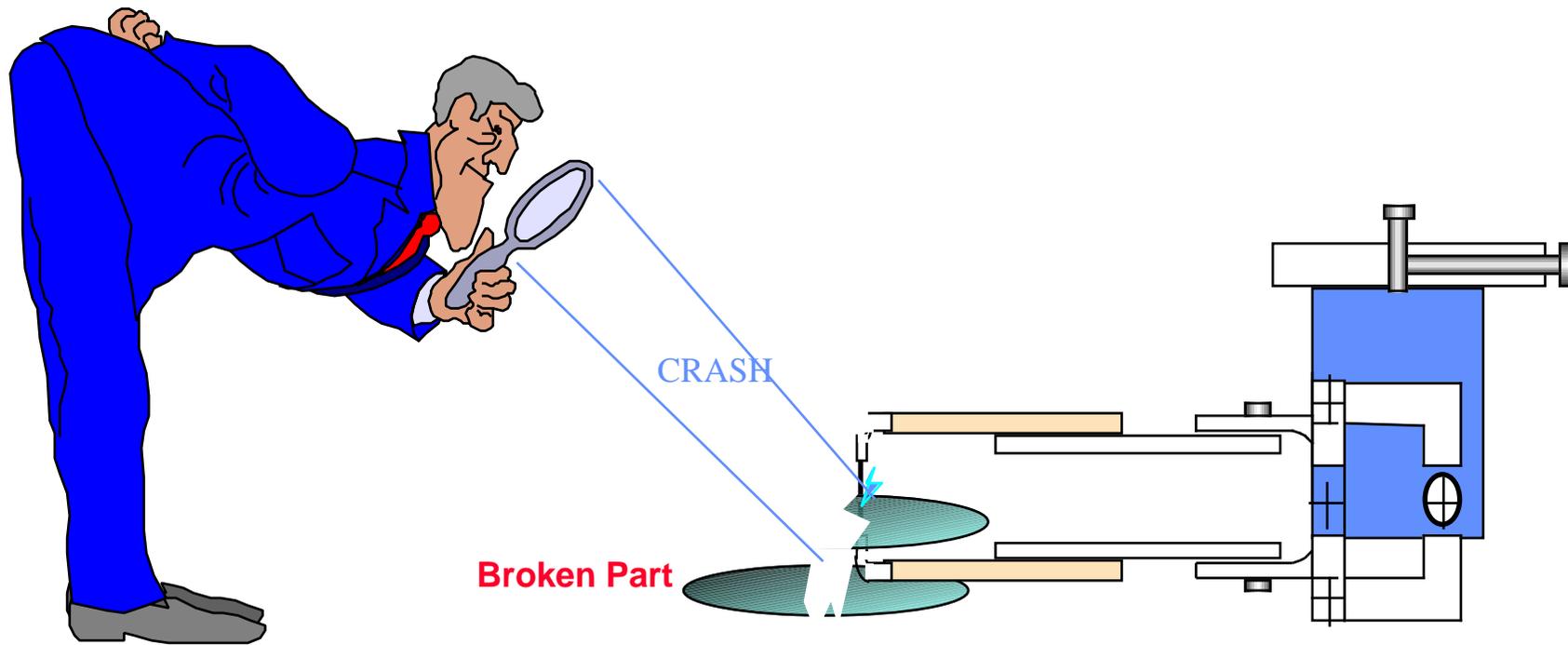
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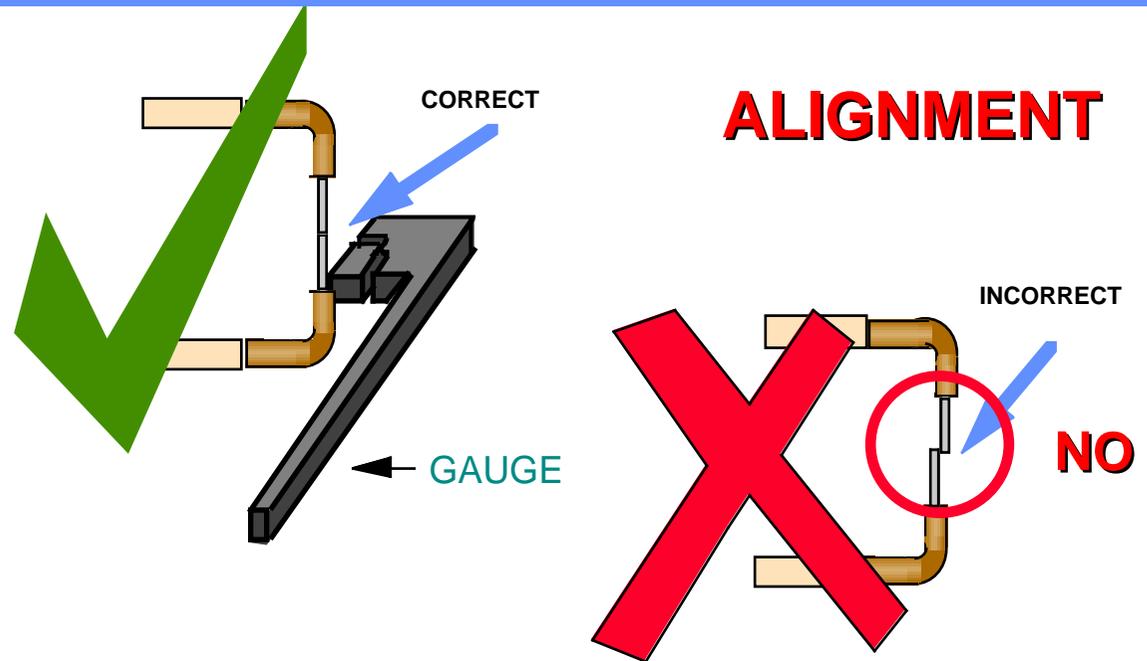
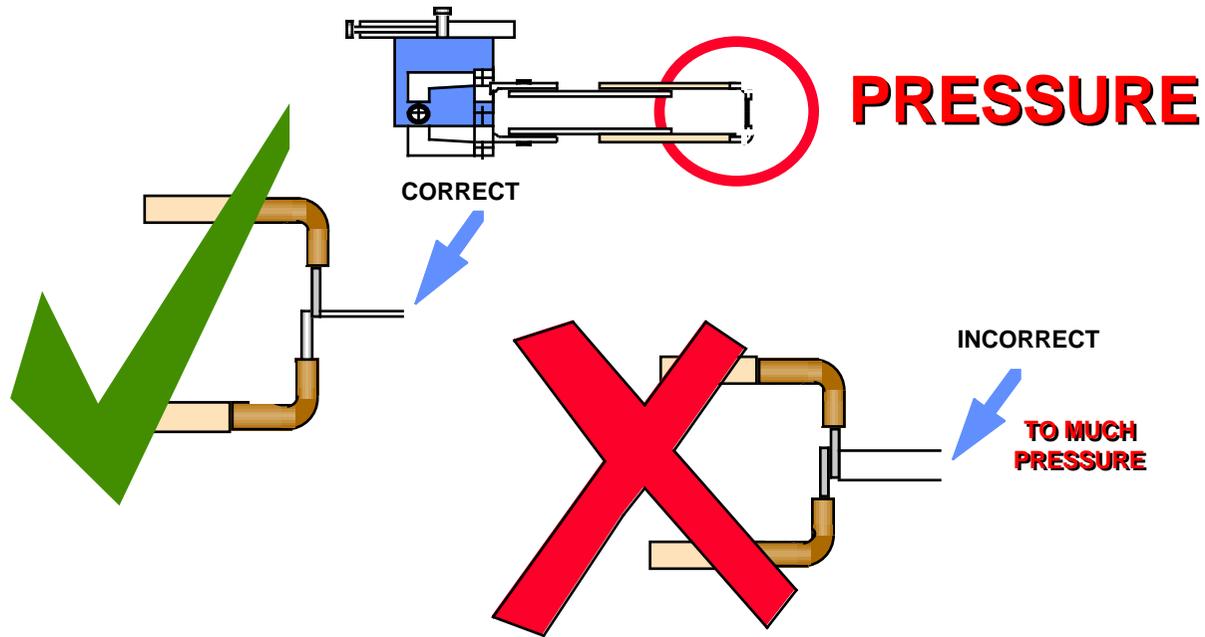


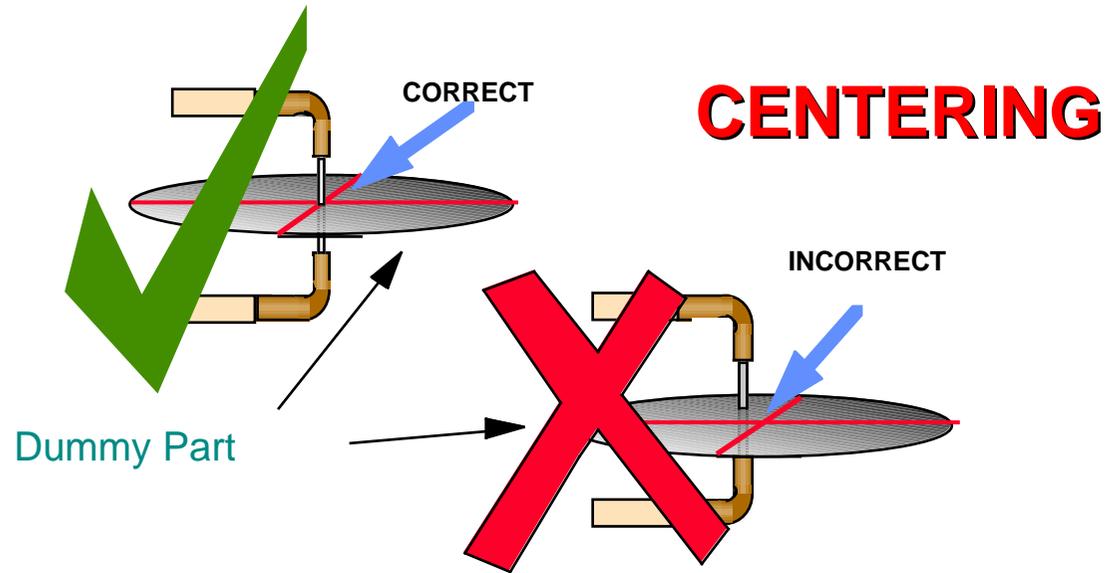
# CLEANING IS INSPECTION...



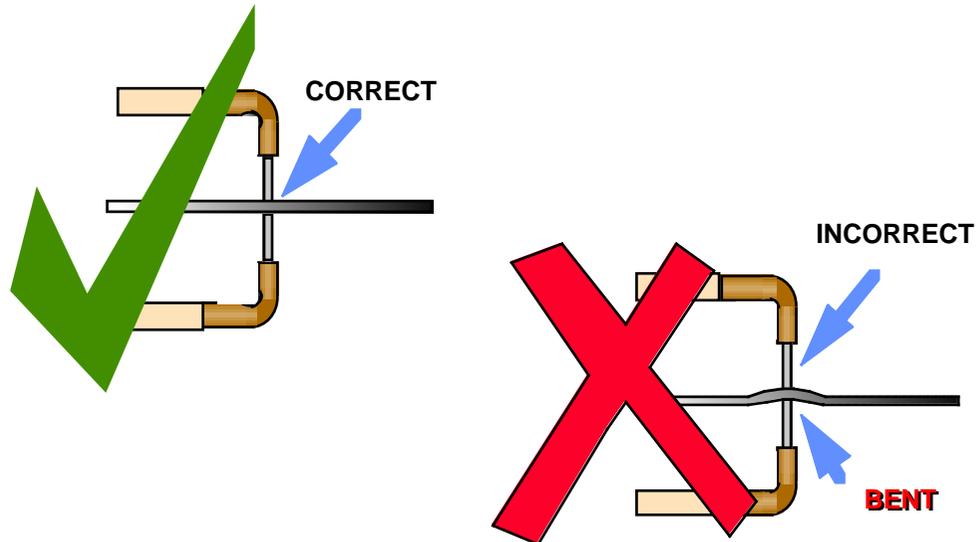
# INSPECTION IS DETECTION.



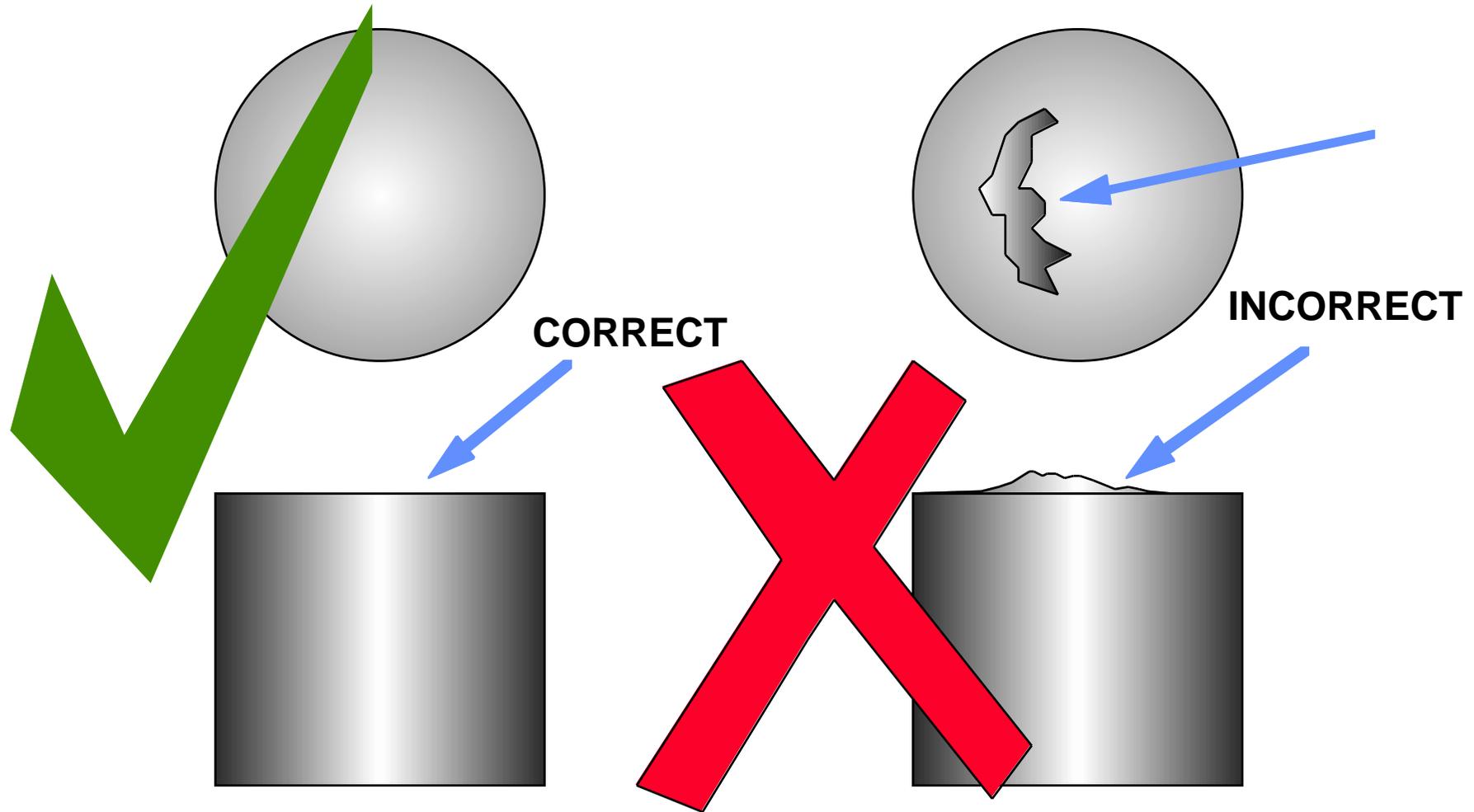




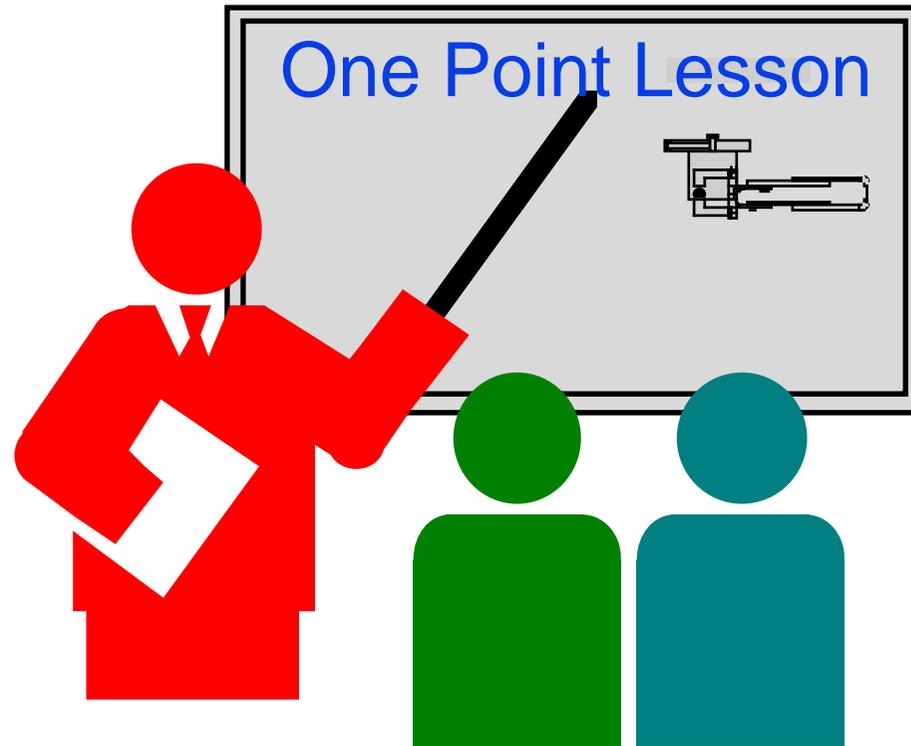
# SYMMETRY



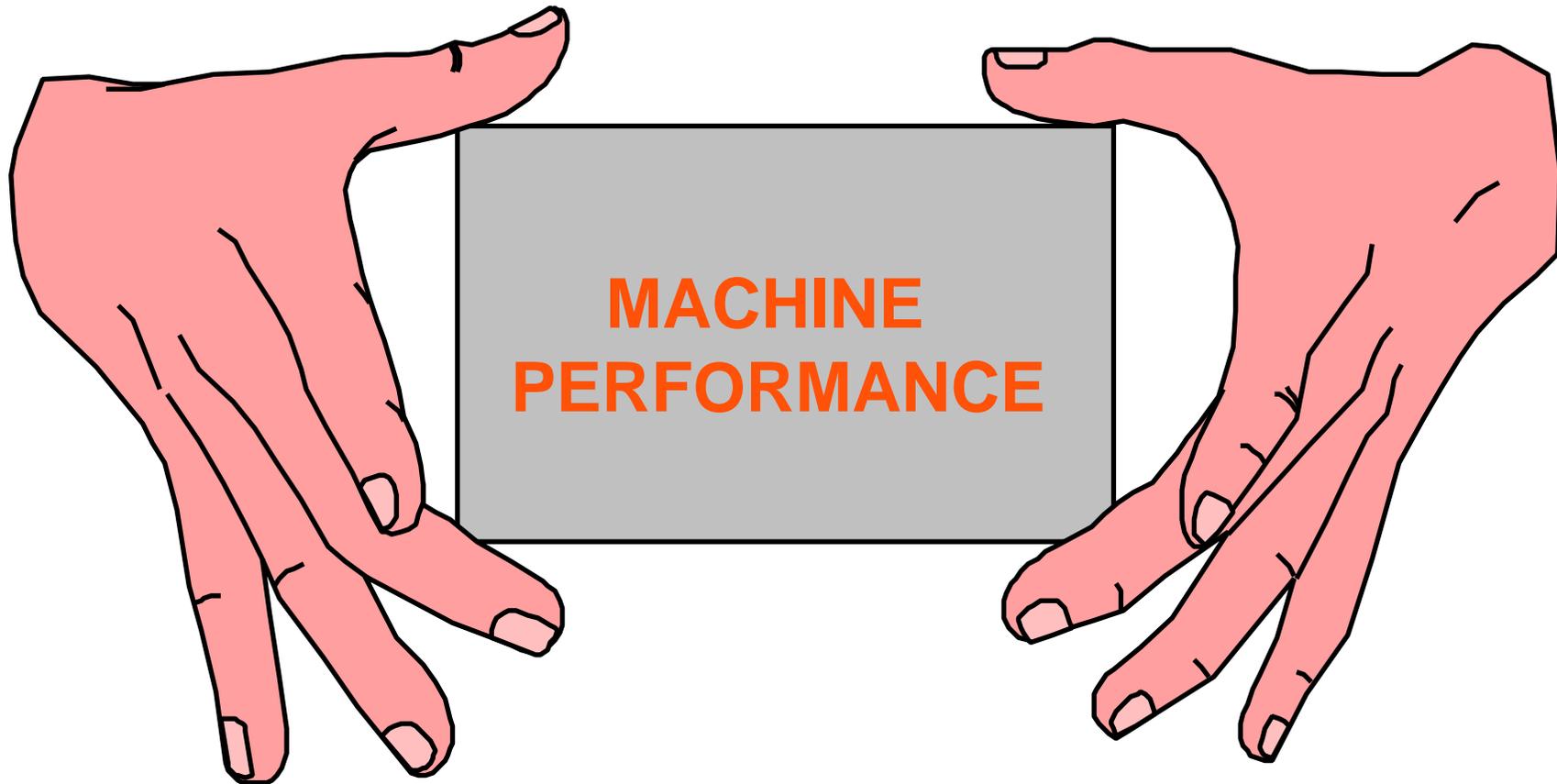
# CONTACT



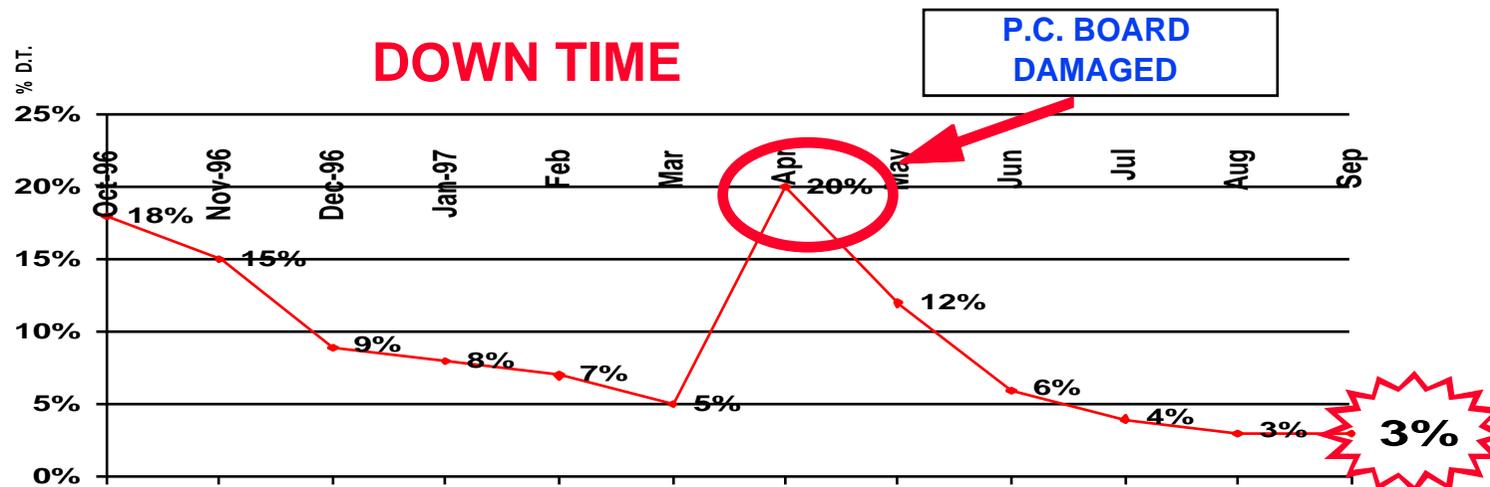
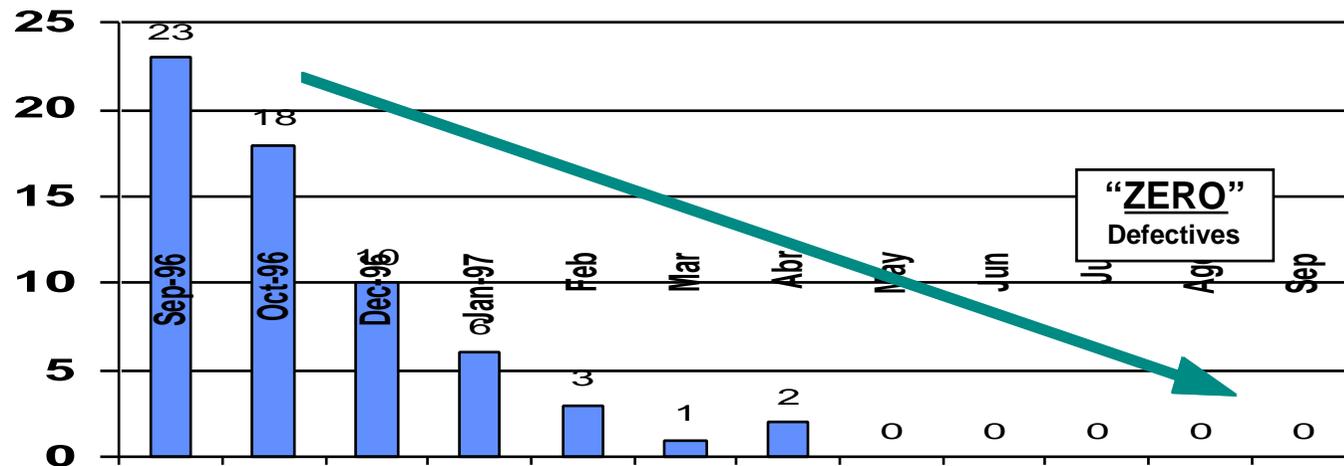
# TO STANDARDIZE AND PREVENT RECURRENCE



Courtesy, in part, of Motorola SPS.  
Thank You!

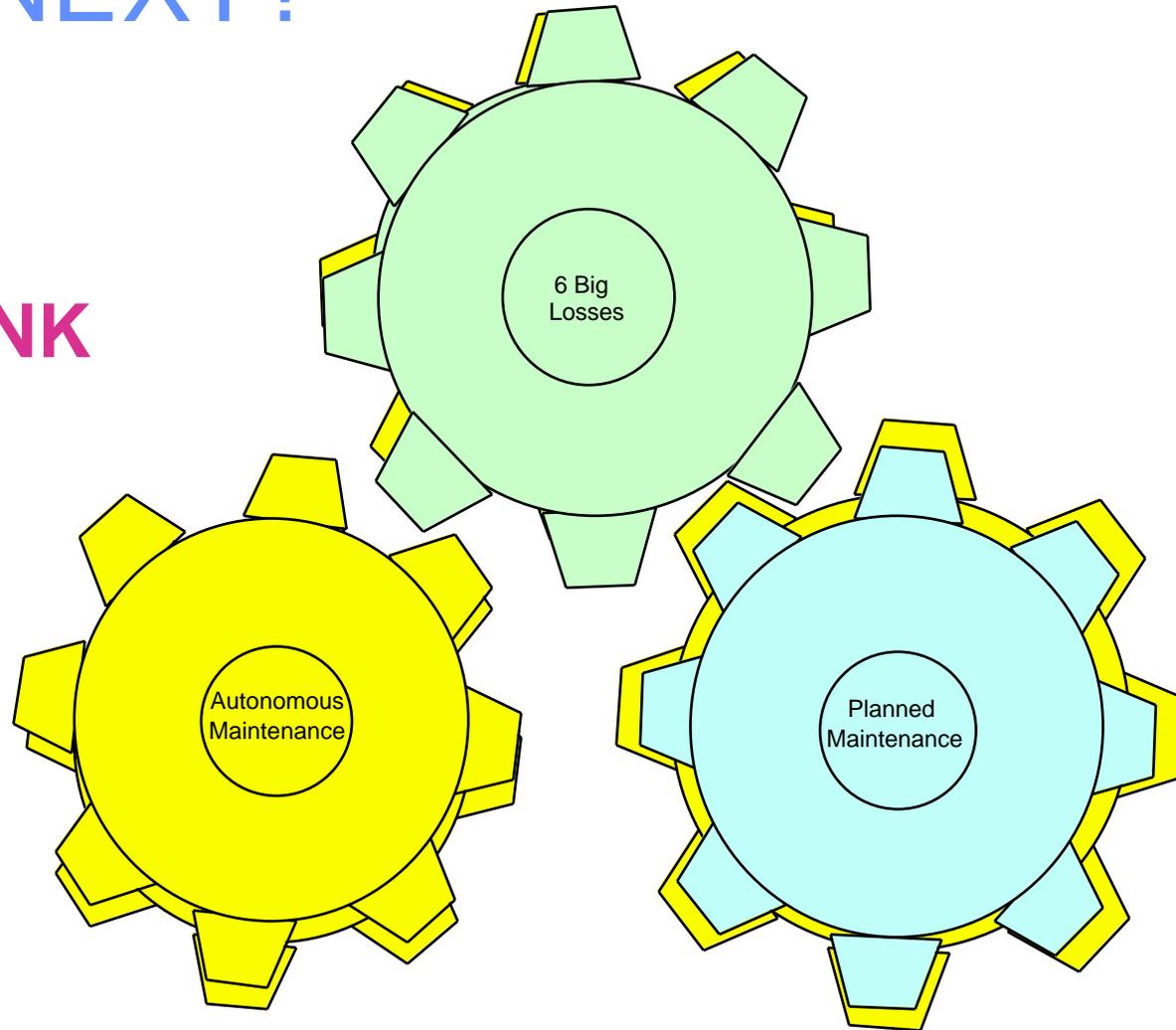


## Defectives



# WHAT IS NEXT?

**LINK**



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Thank You!

