



**INTERNATIONAL OPERATIONS & MAINTENANCE CONFERENCE  
IN THE ARAB COUNTRIES**

**UNDER THE THEME**

**"MANAGING MAINTENANCE WITHIN INDUSTRY 4.0"**

**CONICIDE WITH THE 16<sup>TH</sup> ARAB MAINTENANCE EXHIBITION**

Total Productive Maintenance Implementation in South East Europe. The experience from the Greek Maintenance Community

**George Effraimidis**

Chairman, Hellenic Maintenance Society  
CEO Atlantis Engineering

4.0



# Hellas (Greece)

Sun



History

# Hellas (Greece)

## Industry



## Logistics



## Agriculture





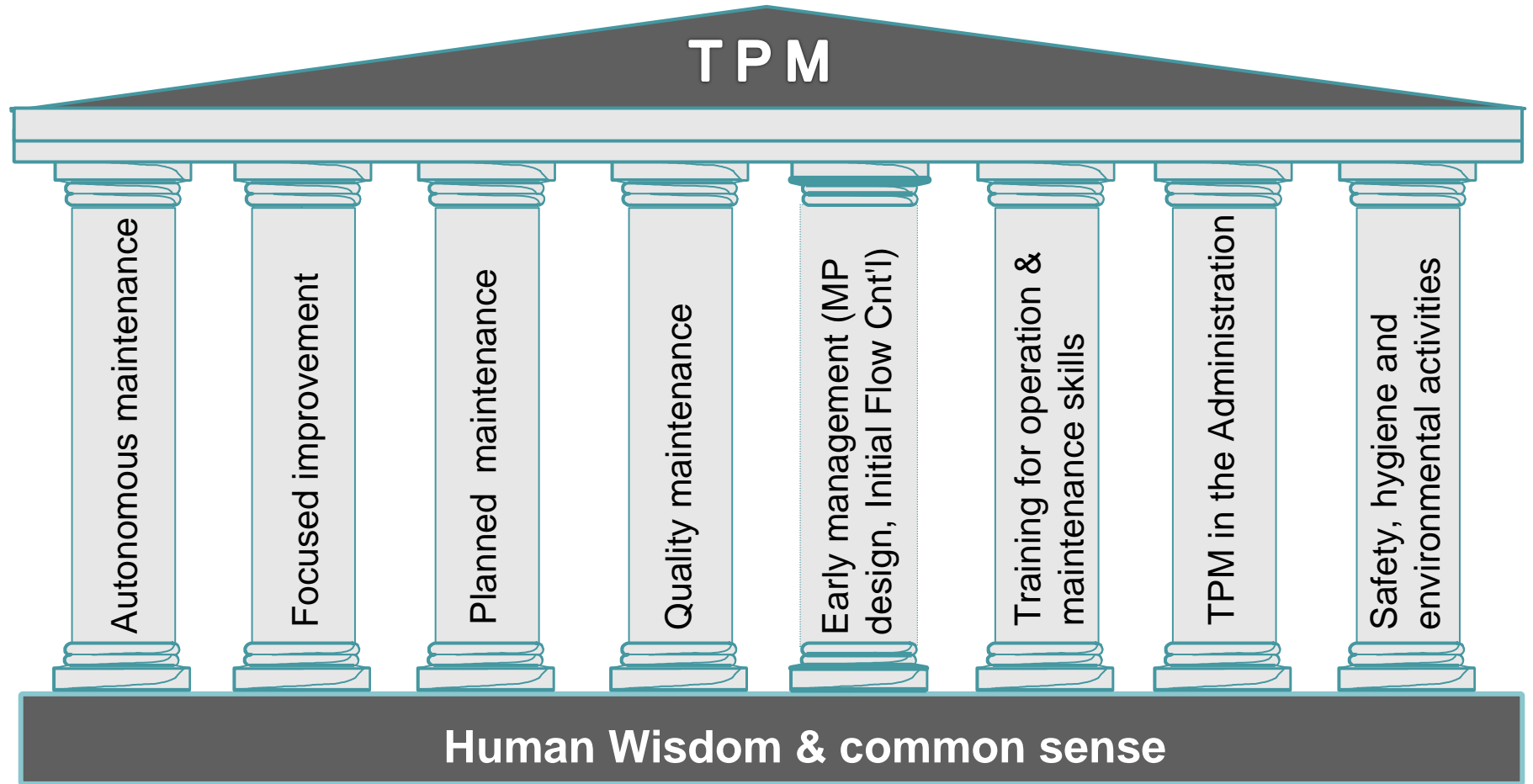
2009 - 2016

# Hellenic Maintenance Society



Vamvalis Cosmas, EFNMS Chairman

# Total Productive Maintenance



# TPM promises



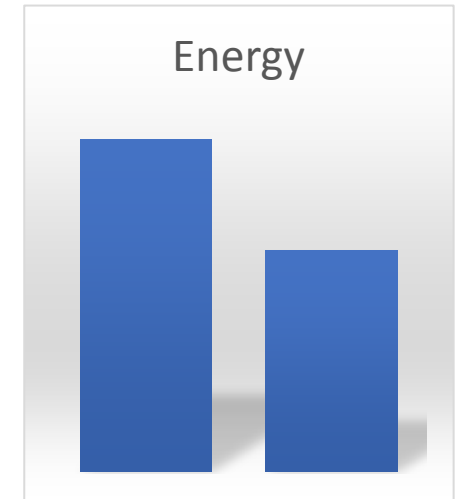
-8%/year



-13%/year

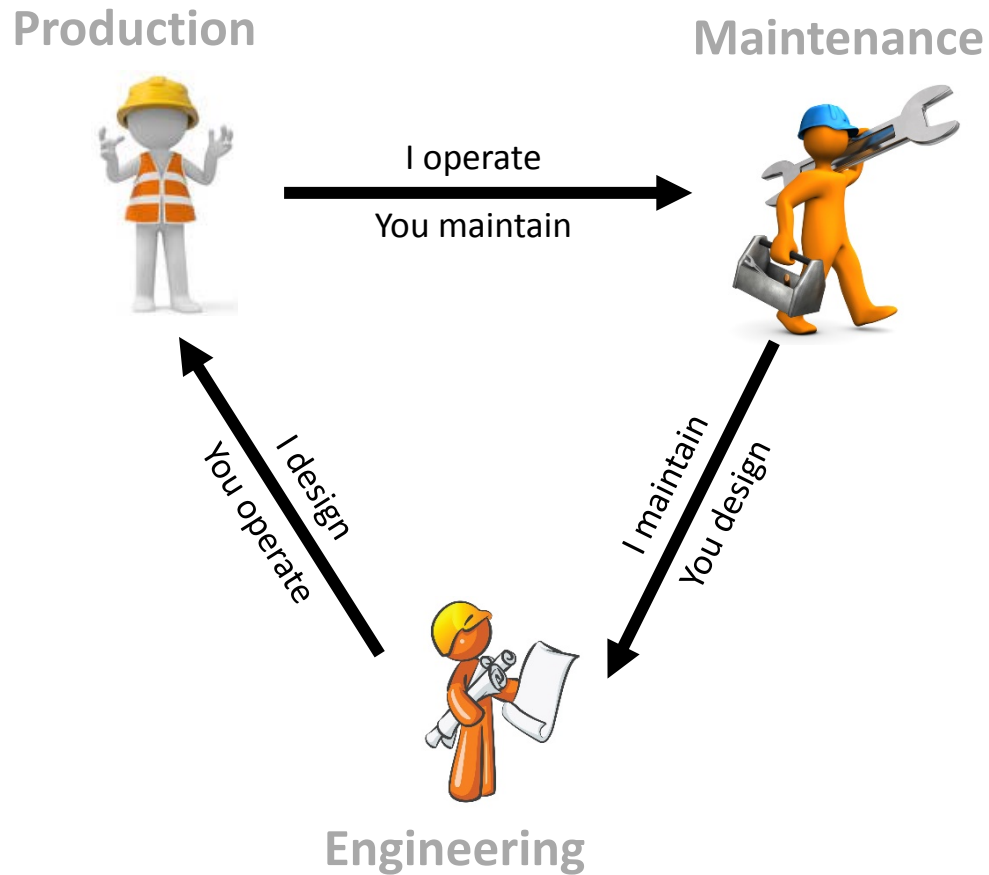


+2%/year



-5%/year

### Old mentality



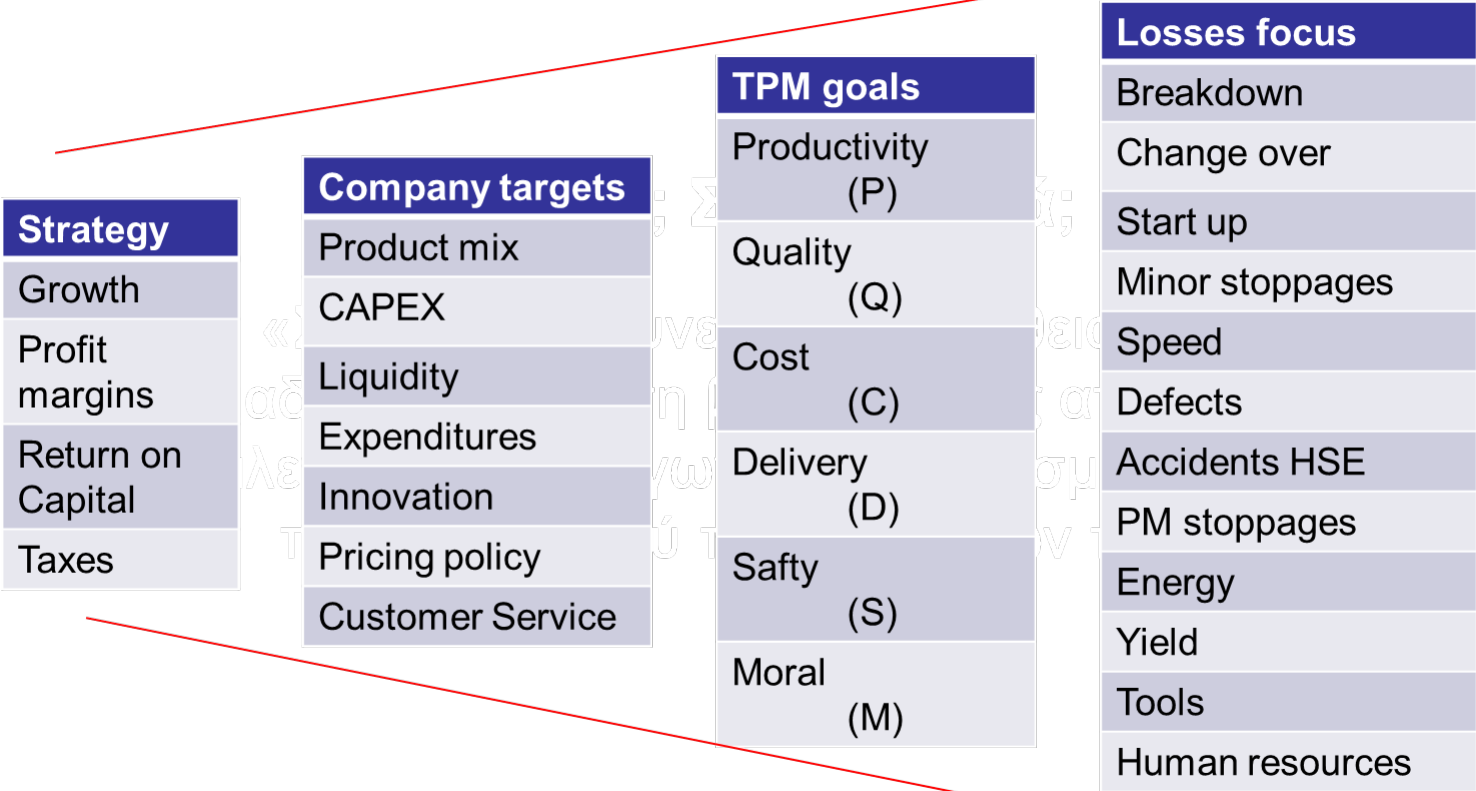
### TPM mentality



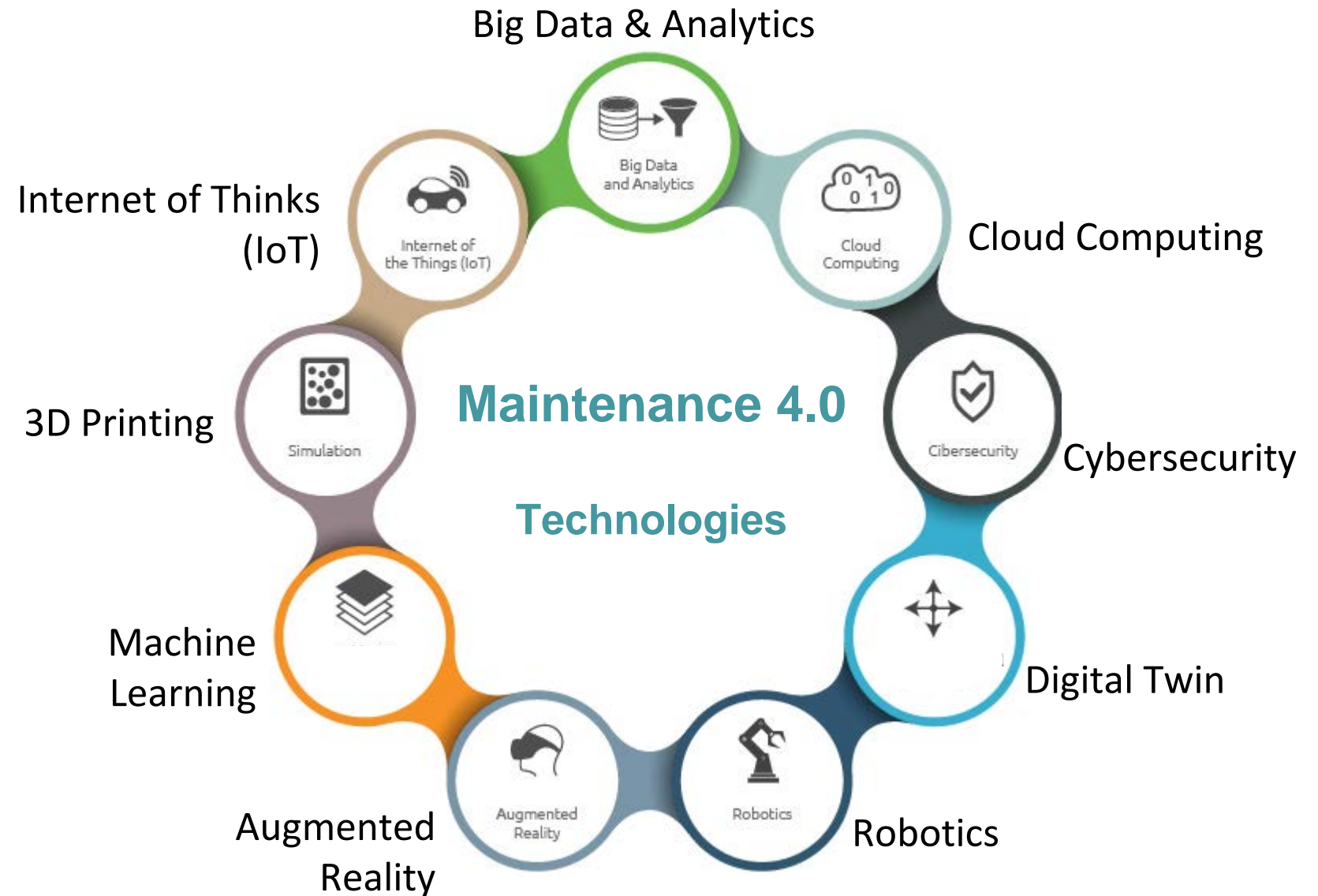


# Focused Improvement

Connect daily priorities with company strategy



# Maintenance 4.0



# People Profile



- They believe that they know everything
- They don't like to follow procedures
- They don't share their knowledges
- They prefer to repair than to prevent

## Change management Key Factors

- Collaboration is the only way to create value
- Every one will have a share from the added value



Companies are created for the purpose of

**PROFIT**

which will be shared in a fair way to

- Owners
- Employees
- Society

**Aristotle**



Cna all oru epmleoye pratciptae in  
Tatol Pordcoutvie Miatnneace ipmlemnetaiotn ?



“Share to Grow”

# TPM Case study



**M. J. MAILLIS S.A.**

Metal industry

annual capacity	110.000 tn
Field area	72.000 m <sup>2</sup>
Building area	23.500 m <sup>2</sup>
Total employees	134
Maintenance employees	21

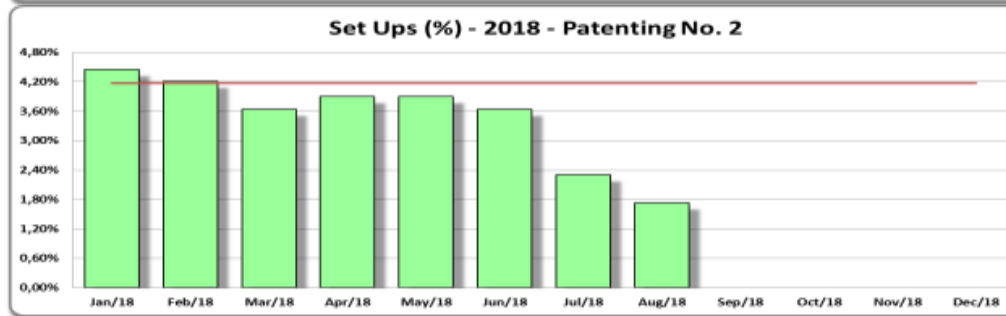
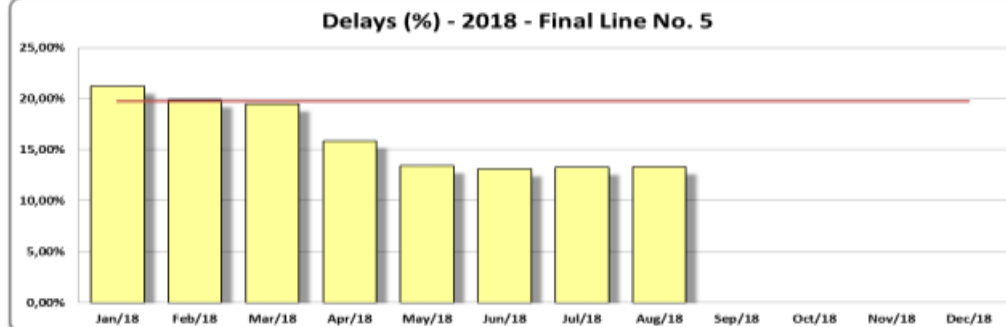
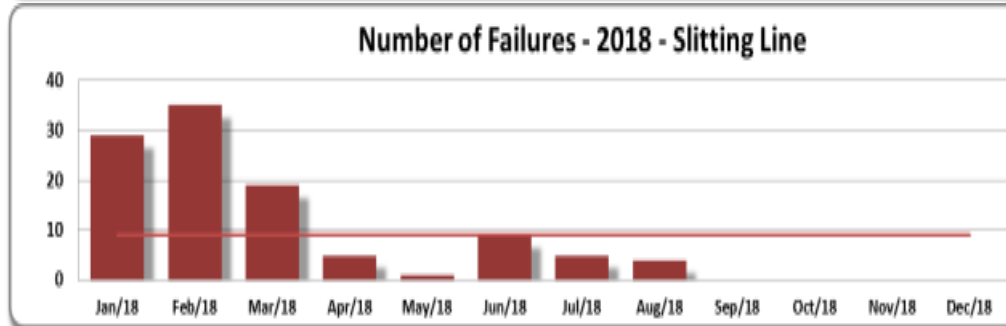
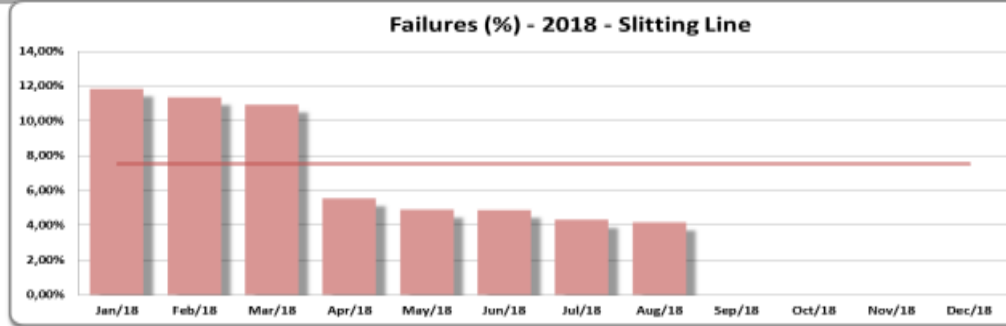
# TPM Case study

---

■ M. J. MAILLIS S.A.







- OEE
- Technical Availability
- Number of failures
- MTBF
- MTTR
- Delays (time)
- Set-up (time)



F- Tags

OEE

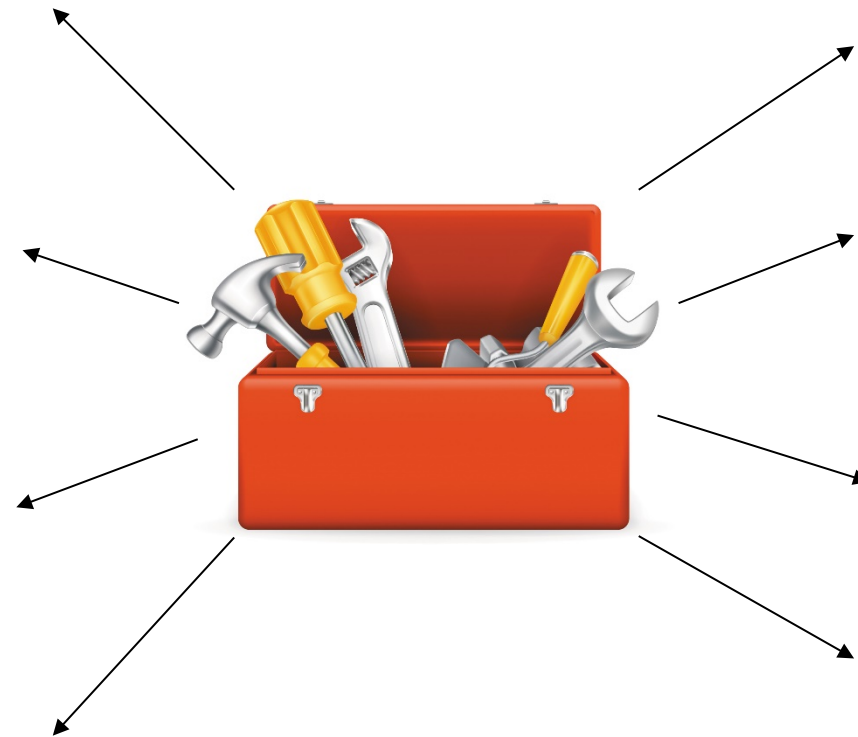
SMED

OPL

Visual Control

MTBF

5 Whys



QC Story

Poka - Yoke

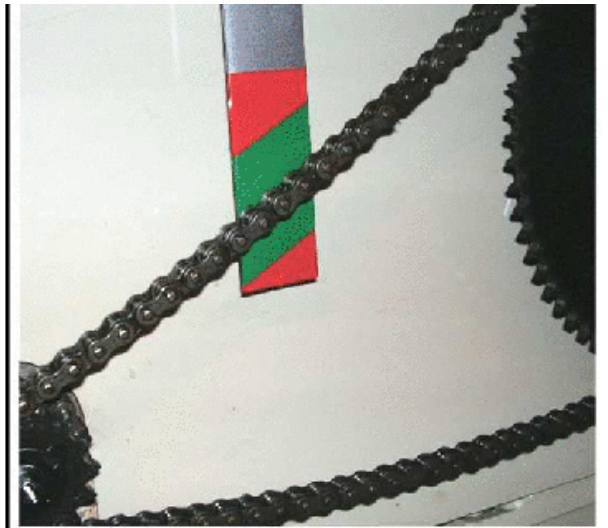
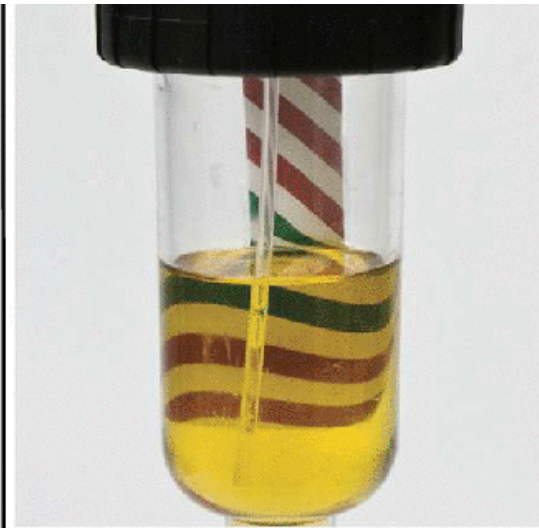
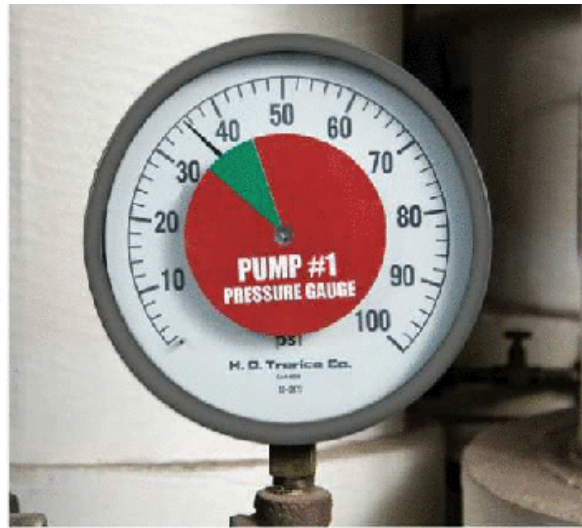
5 S

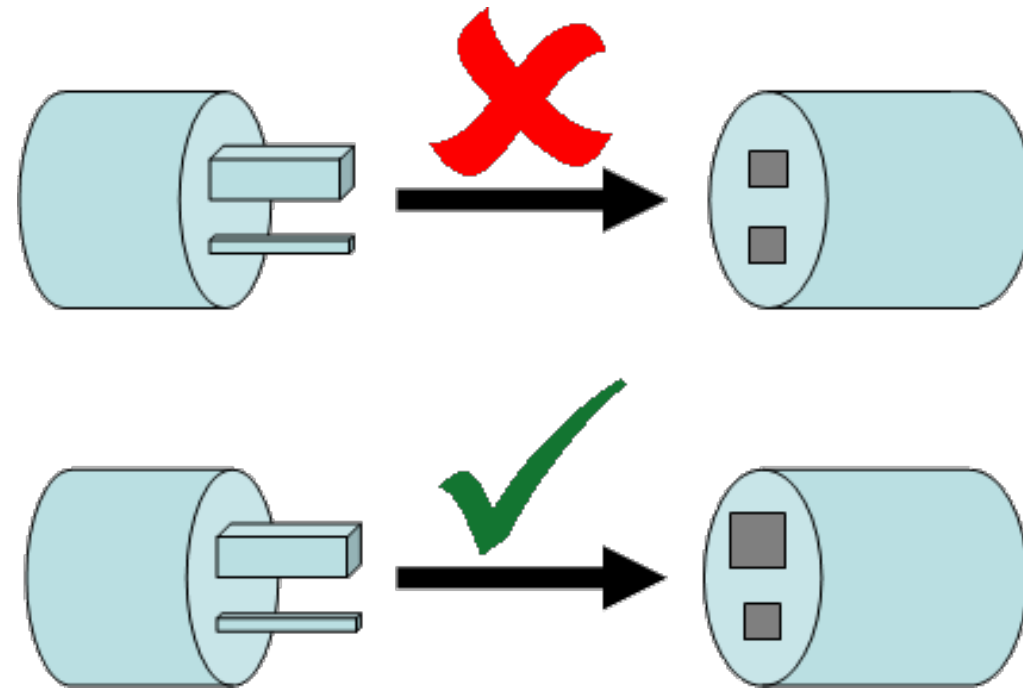
Activity Board

Why-Why

4M

# Visual Control techniques





# Activities boards

... in every TPM team (meeting point)



# CMMS Implementation

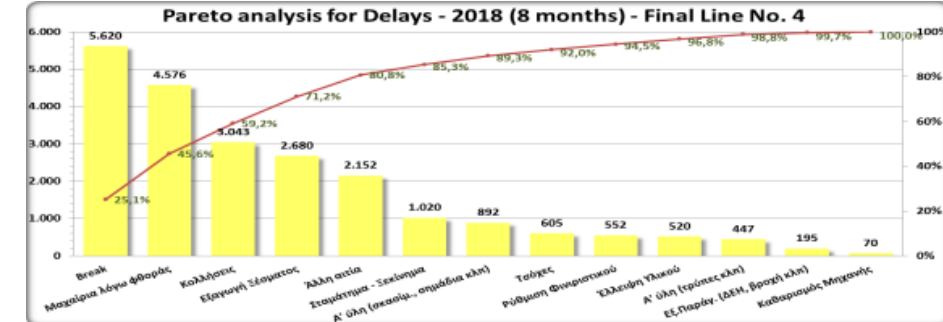
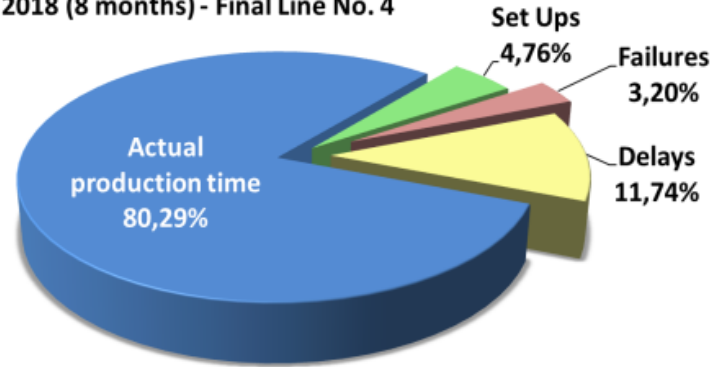


234	Air compressor 3S	Preventive	Air Compressor Refrigeration 12 Months	6/27/2013	0.50
242	Cleaning central system - Coagulator	Fault	Broken shaft		0.00
243	Metal detector	Deferred Corrective	Unexpected on-off		0.00

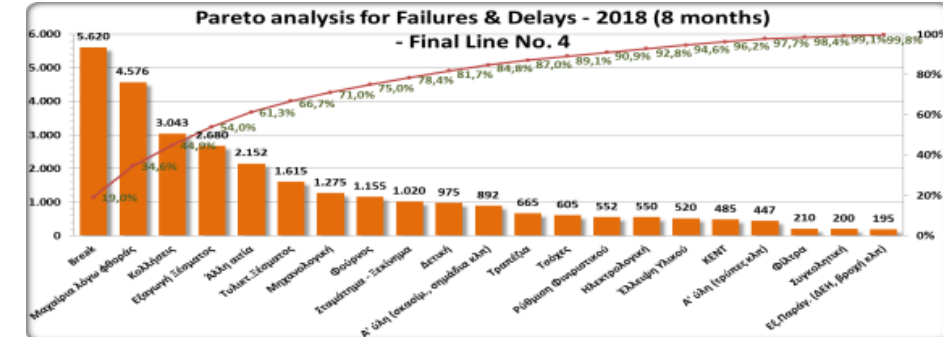
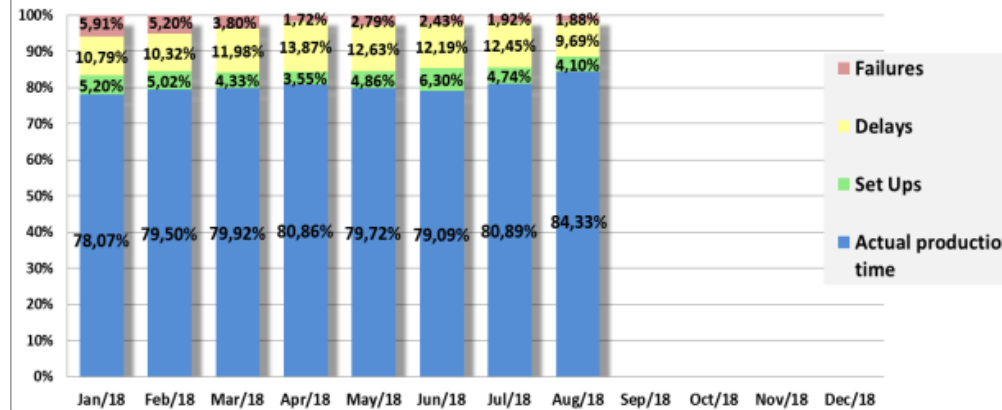
# Losses, times & KPIs Analysis

## ...Pareto

Time distribution 2018 (8 months) - Final Line No. 4



Time distribution 2018 - Final Line No. 4



## Examples from implementing AM, 5S, KAIZEN , SMED, «Before - After»



**DESCRIPTION:** MARKING PASSAGEWAYS AND STORAGE LOCATIONS ON FLOOR

**BENEFIT:** SAFETY AND VISUAL IMPROVEMENT



**DESCRIPTION:** COVERING - PROTECTION OF ELECTRIC CABLES CHANNELS

**BENEFIT:** SAFETY IMPROVEMENT - AVOID OF ACCIDENTS, DIRT AND CABLE WEAR



# TPM Results

## Examples from implementing AM, 5S, KAIZEN , SMED, «Before - After»

### IMPROVEMENT

AFTER

BEFORE

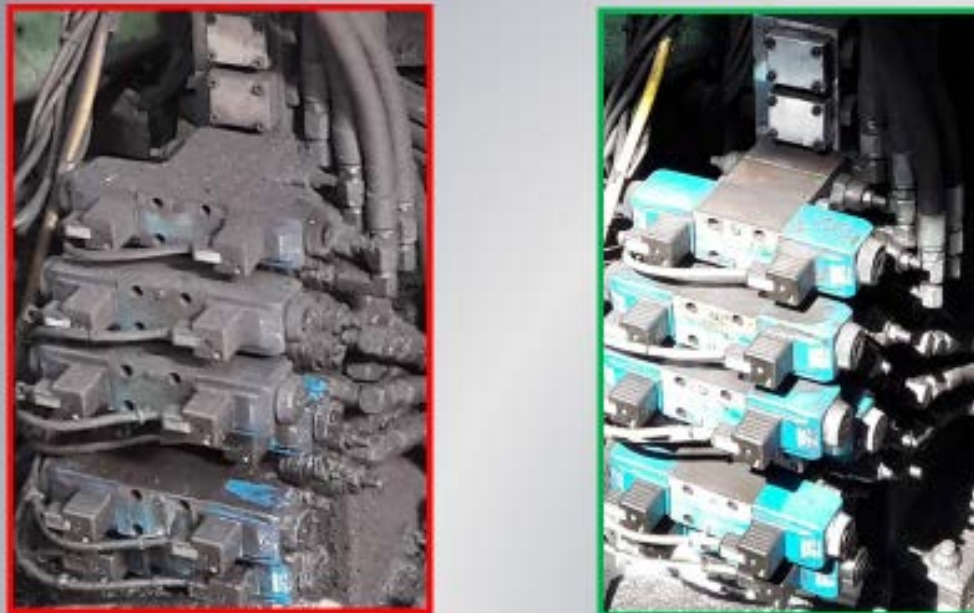


**DESCRIPTION:** CLEANING OF SUPPORTING ROLL EQUIPMENT  
**BENEFIT:** REVELATION OF LUBRICANT LEAKING POINTS, MECHANICAL DAMAGES, OPERATION IMPROVEMENT & INCREASED LIFE TIME

### IMPROVEMENT

BEFORE

AFTER



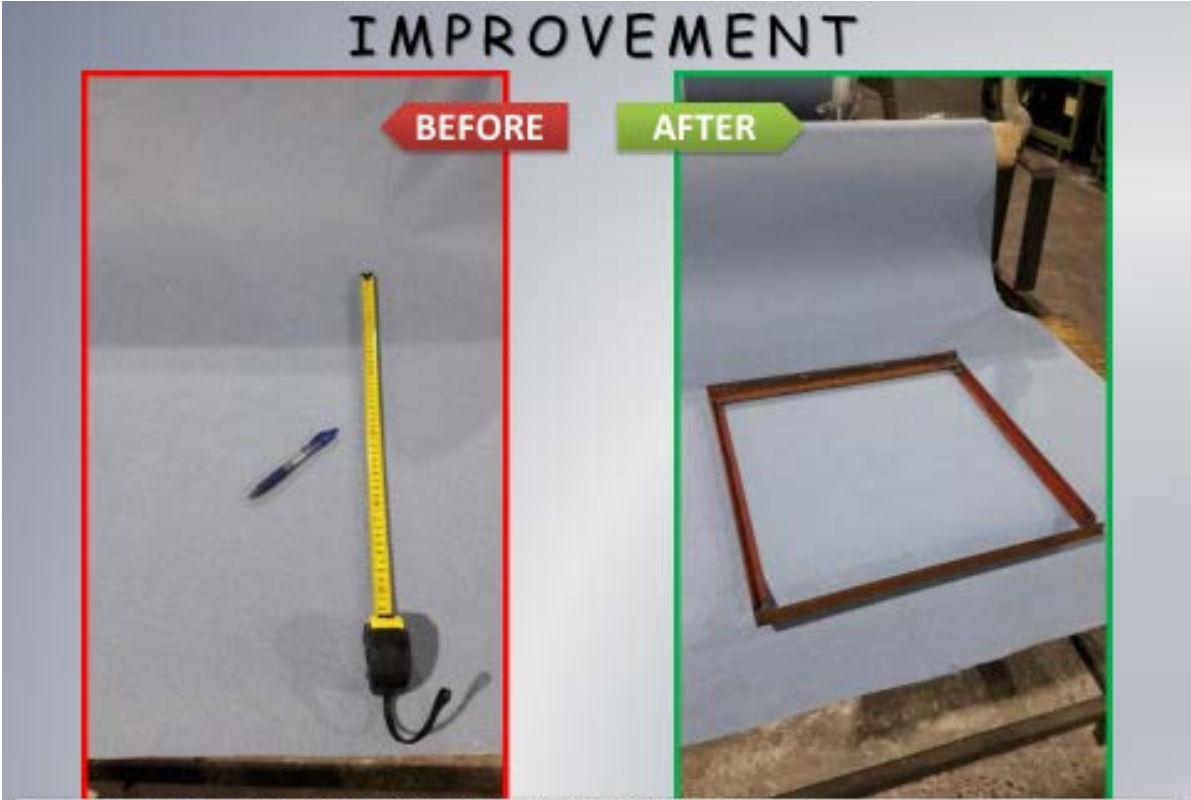
**DESCRIPTION:** CLEANING OF ELECTRIC VALVES  
**BENEFIT:** REVELATION OF MECHANICAL DAMAGES, OPERATION IMPROVEMENT & INCREASED LIFE TIME

# TPM Results

## Examples from implementing AM, 5S, KAIZEN , SMED, «Before - After»



**DESCRIPTION:** RECONSTRUCTION OF STEEL STANDS TO STORAGE PUSH CARTS  
**BENEFIT:** TIME SAVING ON SETUP, VISUAL AND SAFETY IMPROVEMENT



**DESCRIPTION:** MOLD CONSTRUCTION FOR CUTTING FELT  
**BENEFIT:** TIME SAVING FOR ONE OPERATOR: 6 HOURS PER MONTH

# TPM Championship

## Innovations to motivate employees

### CHAMPIONSHIP 2018 ( OEE target achievement rate)

#### Score in the 8th game

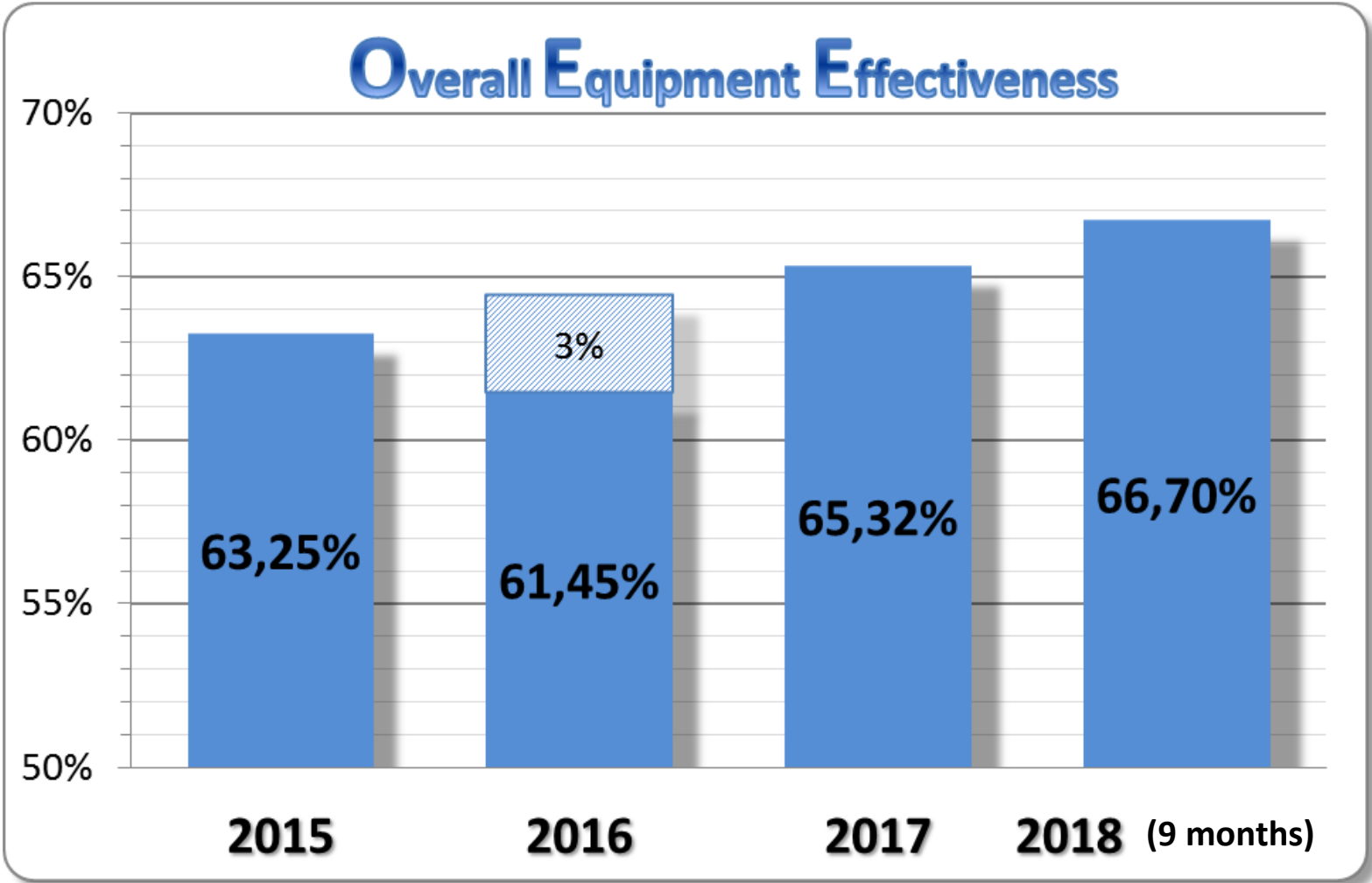
RANK	TEAM	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2018
1	Slitting	99,16%	96,88%	110,57%	102,22%	106,05%	105,58%	110,24%	104,68%					104,42%
3	Final line 3	97,83%	102,54%	101,22%	103,30%	105,09%	96,40%	97,00%	106,01%					101,17%
2	Final line 5	100,03%	102,47%	102,36%	97,64%	100,99%	101,20%	92,89%	102,76%					100,04%
4	Final line 4	99,22%	98,94%	104,28%	87,86%	101,16%	97,96%	101,69%	98,58%					98,71%
5	Pickling	98,89%	102,02%	104,96%	94,71%	99,99%	97,14%	84,15%	94,43%					97,04%
6	Mill 2	99,36%	104,82%	109,63%	95,78%	96,96%	90,13%	89,56%	86,62%					96,61%
7	Patenting 1	96,61%	88,44%	103,31%	102,63%	98,24%	96,42%	79,79%	98,48%					95,49%
8	Mill 1	90,15%	102,33%	102,20%	90,31%	96,86%	98,71%	90,47%	92,71%					95,47%
9	Patenting 2	89,61%	91,03%	89,67%	90,47%	94,27%	100,22%	103,36%	102,55%					95,15%



# TPM Championship

## Recognition & Reward System





# World Class Manufacturing roadmap



## Visitors

Unconcerned Employees

**Ενοικιαστές**  
**tenants**

Disciplined Employees

## Owners

Self motivated Employees



---



**Tnahk yuo**

Goegre Effraimidis

ge@abe.gr