What is WCM?

It is our “Continuous Improvement System”

- Founded in TPM
What is World Class Manufacturing?

WCM is a mindset based on a continuous improvement approach.

WCM has its foundations in the Total Productive Maintenance (TPM), a maintenance process developed in Japan for improving productivity by making processes more reliable & less wasteful.
What is TPM?

Total Productive Maintenance

- Origins. 1970s in Japan. Developed by JIPM

- A System emphasizing complete Care (Maintaining) of machines delivered dramatic results ...

TPM = WCM

- Zero BDs, Zero Defect and Zero Accident.
Japanese Institute of Plant Maintenance

JIPM

- Established in 1969
- Non-Profit, Government Organization linked to Ministry of Industry and International Trade.
- Develops and promotes TPM.
- Since 1971 auditing and presenting awards for TPM Achievement (since 1991 Internationally).

- Audits are a Stepwise process with a progression of awards levels (5 in total) from TPM Excellence Award to TPM World Class Award.
- Consulting support via their ”sister company” JiPM-S (Solutions) which is an independent consulting company.
External recognition for excellence
JIPM Total Productive Maintenance Awards

The award system judges the results of a plant’s TPM activities. On average, it takes about 10 years to go from the first to final level.
WCM Journey

2001 Kick off

2005 JIPM Excellence Award

2008 JIPM Consistency Award

2010 JIPM Special Award

2012 JIPM Advanced Special Award

2015 JIPM World Class Award

"There’s no limit for our improvements"
WCM Principles

What makes WCM being different!
Innovation and Kaizen
WCM approach to gain the competitive edge

- Innovation
  - Big jumps
  - Big investments
  - Top-down approach

- Kaizen
  Gradual, continuous improvement

- Competitive advantage
WCM basic principles

► Zero Accidents, Zero Breakdown, Zero Defects, Zero Scrap,
► Continuous improvement through loss eradication
► No type of waste is accepted
► Methods for improvements are applied strictly

► Voice of customer is heard to the last level in the organization
► People are the driving force of change
► Motivating environment
► All faults are visible
Our Mission

To add value to our Business and Customers by driving for a Zero Loss Organisation

**HOW ?**

....through the continuous development of:

- People
- Processes
- Organization
Our Strategy

- **Develop People**
  - Training
  - Coaching
  - Empowering people for self learn

- **Develop Processes**
  - Standardize and align methods and tools
  - Transfer WCM knowledge sharing best practices

- **Develop Organization**
  - Promote WCM people integration
  - Keep WCM community alive
What is a Loss?

► Something we do that doesn’t add any additional value to the final customer’s product
► It is often perceived as inevitable
► It can be eliminated ... for the most part
What is a Loss – specifically?

It is the difference between the current situation and the ideal situation

Steps to have a good losses understanding:

- Clear measurement (KPIs and Data Collection)
- Clear definition for the ideal situation (Zero Loss Level)
- KPI Loss Tree (Different Levels of losses – more details)
- Clear understanding of biggest losses (Launch teams)
Within the loss you need to identify all different failure modes!
Concept of the Small Steps

Within the loss you need to identify all different failure modes!

How to eat the elephant?

Bit after bit!

Generic View

Specific View
Equipment efficiency

\[ OEE = \frac{B}{A} \times 100 \]
\[ EE = \frac{B}{C} \times 100 \]

Difference: Lack of orders
Print - deployment of losses - example

EE vs. Losses Printer 2003

EE 52.4%
Losses 47.6%

Losses Printer 2003

- Other losses
- Quality losses
- Breakdowns and repairs (21)
- Planned Maintenance (28)
- Speed losses
- Other stops (23, 25, 26, 27)
- Set-up time (12)

Other losses 4.0%
Quality losses 5.1%
Breakdowns and repairs (21) 6.4%
Planned Maintenance (28) 6.5%
Speed losses 22.5%
Other stops (23, 25, 26, 27) 55.1%
Set-up time (12) 0.3%
Print - deployment of set up time

**Losses Printer 2003**
- 55.1% Other losses
- 6.4% Quality losses
- 6.5% Breakdowns and repairs (21)
- 6.4% Planned Maintenance (28)
- 5.1% Speed losses
- 4.0% Other stops (23, 25, 26, 27)
- 36% Set-up time (12)

**Set up losses Printer 2003**
- 7% Other losses
- 57% Quality losses
- 36% Breakdowns and repairs (21)
- 18.7% Planned Maintenance (28)
- 14.0% Speed losses
- 22.5% Other stops (23, 25, 26, 27)
- 6.0% Set-up time (12)

**Set up time deployment FP2003**
- 6.0% Other losses
- 5.4% Quality losses
- 14.0% Breakdowns and repairs (21)
- 8.6% Planned Maintenance (28)
- 19.8% Speed losses
- 26.8% Other stops (23, 25, 26, 27)
- 20.5% Set-up time (12)

**Set up frequency FP 2003**
- 3.8% Other losses
- 6.8% Quality losses
- 17.4% Breakdowns and repairs (21)
- 8.7% Planned Maintenance (28)
- 6.6% Speed losses
- 9.6% Other stops (23, 25, 26, 27)
- 20.3% Set-up time (12)
“LOSSES” are the Key
The Base of the Continuous Improving in WCM
The WCM Infinity Loop

1. Seek the losses

2. Eradicate losses

3. Maintain the condition
The Infinite Loop
The Base of the Continuous Improving

1. Assess Current Situation
2. Restore Basic Conditions
3. Analyze Root Causes
4. Eliminate Root Causes
5. Implement New Standards
6. Improve Standards Reliability
7. Maintain the Standards

Maintain

Eradicate
The three TPM Award levels
Linked with business as a whole in a logical expansion

TPM Level 1
Factory Operational Excellence
Production excellence by learning and mastering TPM tools & techniques

TPM Level 2
Integrated Supply Chain
Defending & strengthening competitive position through flexible & efficient supply chain

TPM Level 3
Extended Supply Chain
Zero loss company via innovative TPM activities
Our 11 Pillars of WCM

Each Pillar
- Focuses on Common Themes/ Losses
- with Expertise in specific Methods and Tools
Pillar Activities

These are the typical activities carried out by all Pillars

- Deployment
- Potential gains
- Planning teams
- Evaluation resources
- Training
- Support
- Audits
- Monitoring results
Pillars Support on Three Levels

Seek the Loss
- Investigates the losses that are having an effect on the KPI’s.
- Develops a master plan that identifies improvement actions and teams.

Eradicate the Loss
- Supports the improvement team and identifies training and development needs.
- Implements the audit schedule.

Maintain the Condition
- Develop systems to prevent the losses.
- Building Systems -
AM Man - Machine development

1. **Change of attitude**
   - Can detect problems and understand the principles and the procedures of equipment improvement

2. **Competence and effectiveness**
   - Knows the function and structure of equipment and equipment-product quality relationship

3. **Cleaning and lubrication standards**
4. **General Inspection**
5. **Autonomous Inspection**
6. **Standardisation**
7. **Autonomous management**
3. **Autonomous Kaizen**
   - Can manage equipment

We take care of our process
I support you
The route for Autonomous Maintenance

1. **Initial cleaning**
   - Safety awareness: safety to clean
   - Initial cleaning: in depth cleaning & tagging exercises
   - 5S: sort out, set order, shine, standardize, sustain
   - CIL: introduction of first temporary standard
   - Tagging: spot equipment deterioration
   - 5 sense: spot equipment deterioration

2. **Eliminate sources of dirt and difficult to clean & inspect areas**
   - 1. Safety awareness: safety to clean
   - 2. Initial cleaning: in depth cleaning & tagging exercises
   - 3. 5S: sort out, set order, shine, standardize, sustain
   - 4. CIL: introduction of first temporary standard
   - 5. Tagging: spot equipment deterioration
   - 6. 5 sense: spot equipment deterioration

3. **Create and maintain cleaning, inspection & lubrication standards**
   - 1. Lubrications concepts & on the job inspection
   - 2. ECRS: simplify the lubrication system
   - 3. Visual Control: create a visible lubrication system
   - 4. CIL: update inspection plan
   - 5. Monitor results

4. **General inspection**
   - 1. Lubrications concepts & on the job inspection
   - 2. ECRS: simplify the lubrication system
   - 3. Visual Control: create a visible lubrication system
   - 4. CIL: update inspection plan
   - 5. Monitor results

5. **Autonomous inspection**
   - 1. 5 why analysis: identify and analyse sources of dirt and difficult to clean areas
   - 2. Easy to: countermeasure to eliminate/minimize dirt sources, difficult to clean/inspect areas
   - 3. CIL: create and maintain cleaning and inspection standard
   - 4. Monitor results

6. **Standardisation**
   - 1. ECRS: simplification of maintenance, safety, quality inspection
   - 2. QA, QX, QM understanding
   - 3. Consolidate inspection plan
   - 4. Develop expertise to use measurement instrument
   - 5. Define countermeasures/restoration instruction for deviation anomalies
   - 6. CIL: create and maintain cleaning and inspection standards
   - 7. Monitor results

7. **Autonomous Management**
   - 1. Autonomous Inspections - Process Control
   - 2. Analysis abnormalities
   - 3. Integrate spar parts, jigs & tools, materials, products, WIP, etc
   - 4. Textbooks operation skills
   - 5. Evaluation table for operation skills
   - 6. List for problems point corrections
   - 7. Improve 5 conditions to 0 defect
   - 8. Component life span management
   - 9. Integration of defects analysis
   - 10. Speed losses analysis
   - 11. Setup anomalies analysis

8. **Inventory of Standards**
   - 1. Pneumatic & Hydraulic concepts on the job inspection
   - 2. Drive, transmission and kinetics system concepts & on the job inspection
   - 3. Electric control systems (includes sensors) concepts & on the job inspection
   - 4. Fasteners and equipment main body concepts & on the job inspection
   - 5. Safety concepts on the job inspection
   - 6. General inspection: update inspection plan
   - 7. Visual Control: promote visual management
   - 8. Monitor results (AM effectiveness)

9. **Imporvement and Restoration**
   - 1. ECRS: simplification of maintenance, safety, quality inspection
   - 2. QA, QX, QM understanding
   - 3. Consolidate inspection plan
   - 4. Develop expertise to use measurement instrument
   - 5. Define countermeasures/restoration instruction for deviation anomalies
   - 6. CIL: create and maintain cleaning and inspection standards
   - 7. Monitor results

10. **Standarization**
    - 1. Lubrications concepts & on the job inspection
    - 2. ECRS: simplify the lubrication system
    - 3. Visual Control: create a visible lubrication system
    - 4. CIL: update inspection plan
    - 5. Monitor results

11. **Establishment and Succession**
    - 1. Autonomous Inspections - Process Control
    - 2. Analysis abnormalities
    - 3. Integrate spar parts, jigs & tools, materials, products, WIP, etc
    - 4. Textbooks operation skills
    - 5. Evaluation table for operation skills
    - 6. List for problems point corrections
    - 7. Improve 5 conditions to 0 defect
    - 8. Component life span management
    - 9. Integration of defects analysis
    - 10. Speed losses analysis
    - 11. Setup anomalies analysis

12. **Update the job descriptions**
    - 1. Pneumatic & Hydraulic concepts on the job inspection
    - 2. Drive, transmission and kinetics system concepts & on the job inspection
    - 3. Electric control systems (includes sensors) concepts & on the job inspection
    - 4. Fasteners and equipment main body concepts & on the job inspection
    - 5. Safety concepts on the job inspection
    - 6. General inspection: update inspection plan
    - 7. Visual Control: promote visual management
    - 8. Monitor results (AM effectiveness)

13. **Ensure cross training process**
    - 1. 5 why analysis: identify and analyse sources of dirt and difficult to clean areas
    - 2. Easy to: countermeasure to eliminate/minimize dirt sources, difficult to clean/inspect areas
    - 3. CIL: create and maintain cleaning and inspection standard
    - 4. Monitor results

14. **Establish Circle meeting**
WCM is based on TEAM WORK

► People working together in teams following a common methodology to deliver results
► Sharing our experiences & a way of working across departments makes everything easier!
World Class Manufacturing ……

1. Data collection
2. Deployment / where are the losses … /
3. Methodologies and tools / 5S, 4M, 5 Why, ECRS, …… /
4. Teams
   - Increase efficiency / productivity
   - Reduction of waste
   - Reduction of complaints and claims
   - Increase Safety
   - Motivation
… WCM is…

… the most complete…

as the practical realisation of the "Learning Organization"
through the application of four basic concepts:

- Committees organisation
- Teamwork
- Approach depth
- Managing by Deployment
What WCM is about

Involving all the available resources
Involve people in a organized way

Team Work

WCM is based on TEAM WORK. Nothing can be achieved if one works alone. But if we share our experience across departments, everything is EASIER!

Together
Employees
Accomplish
More
Why Team work?

More EFFECTIVE Problem solving

- Better decisions
- Better Results

Through Teamwork we CREATE:

- A sense of belonging
- "Grow capability and skills" of WCM System.
- A STRONG FOUNDATION.
How do we organize in Factories?

The three levels in sport and WCM

Football

In the Factory

The owners

The steering committee

The coaches

The pillar coaches

The players and the team

Pillar Coach for Improvement Team A

Pillar Coach for Improvement Team B
WCM must be a real change process
Capable to maintain itself …

If any of the steps are missing, we will not have sustainable change
World Class Manufacturing  
Just common sense?

- World Class Manufacturing opens minds and doors to new possibilities

You don’t know what you don’t know
WCM is a one-way journey

It’s not always easy. Sometimes it’s even painful...but:

It works!

It makes the difference!

It changed the way we do business!

Moving toward World Class
WCM – World Class Manufacturing

“World Class Organizations need World Class People”
Thank you