Increase your profit: World class maintenance for world class manufacturing

Thomas Ålund,
Senior Consultant,
Idhammar AB,
Stockholm, Sweden
Swedish knowledge-base company in the field of operational reliability and maintenance management

Some of our customers:
WHO LOVES MAINTENANCE?

• Nobody likes it!
• Nobody likes to pay for it!
• When it is correct carried out, nobody doesn’t notice it!
• Repair is just done in order to bring back the equipment to normal!

But still it’s inevitable and correct carried out it’s profitable
World Class Manufacturing requires World Class Maintenance
Why WCM?
Reduce Production losses
Reduce Time losses
Reduce Speed losses
Reduce Quality losses
Better Competitiveness
Minimize Costs
Less Impact on Environment
Good Work Environment
Better Profit and Economic stability
KPI’s FOR WCM

OEE > 80%
Repetitive work > 80%
Planned and scheduled jobs > 90%
Occupancy of maintenance technicians > 95%
Written work orders > 98%
Emergency jobs < 10%
To Measure Plant Effectiveness, OEE

Full plant-effectiveness

With full plant effectiveness we mean the maximum that equipment could produce!

All metrics/measurement results are presented in relation to full plant effectiveness.
To Measure Plant Effectiveness, OEE

Full plant effectiveness 100%
Availability 80%
Availability is affected by:

Maintenance related stops:
- Repairs
- Planned stops
- PM work
- Change work

Production related stops:
- Changeover
- Tool changes
- Start-up losses
- Shut down losses
- Cleaning (process)

Lack of resources:
- No production order
- Lack of material
- Lack of staff
- Meetings
- Organizational obstacles

22-24 November 2010, Johannesburg
To Measure Plant Effectiveness, OEE

Full plant effectiveness 100%
Availability 80%
Production speed 75%

Affected by
Short stops-disruptions
Losses due to reduced speed

To measure the production results during the time the equipment does not stand still due to availability related stops.
To Measure Plant Effectiveness, OEE

- Full plant effectiveness: 100%
- Availability: 80%
- Production speed: 75%
- Quality rate: 83%

How many of the produced units meet the quality requirement?
To Measure Plant Effectiveness, OEE

Full plant effectiveness

Availability

Production speed

Quality rate

Actual results

World Class >80%

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To measure Plant Effectiveness, OEE

Actual production time

Operative time

Net operative time

Value increasing operative time

Losses

Utilized production time

Total time for availability related stop

Total time for short stops och Speed or momentum losses

Total time that is used for producing faulty products

Here we can read the result

To measure Plant Effectiveness, OEE

Utilized production time

Net operative time

Value increasing operative time

 Operative time

Actual production time

Losses

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Here we can read the result

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How does OEE impact on profitability?
The Rate of Return Triangle

Revenue

Contribution margin

Result

Common costs

Fixed assets

Current assets

Total assets

Rate of return

%
The OEE will impact on the Rate of Return

Potential revenue

Loss of Contribution
- Reduction in availability
- Reduced quality losses
- Reduced speed losses

Revenue
- Better quality rate
- Better speed performance
- Higher availability
- Image
- Better security of supply

Contribution margin

Common costs
- Less use of spare parts and maintenance material
- Lower labour costs
- Less use of contractors
- More efficient administration
- Lower capital costs
- Lower costs for insurance

Direct costs
- Less energy consumption
- Lower labour costs
- Better safety and less costs
- Work environment
- Environment

Result

Current assets
- Less work in progress
- Less tied up capital in spare parts and material

Total assets

Fixed assets
- Increased value of equipment
- Reduced redundancies
- Less investments in new machines

Rate of return

Potential revenue - Loss of Contribution = Contribution margin

Contribution margin ÷ Total assets = Rate of return

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OEE will impact on the share value

Lost Revenue: 9,427,090 per year
Profitability: 30.45%
Profitability margin: 27.53%
Share value: 309,999,096

Real annual output: 156,203 pcs

Revenue: 28,428,910

Contribution margin: 7,826,878

Result: 4,126,878

Rate of return: 12.2%

Total assets: 33,700,000

Fixed assets: 25,000,000

Current assets: 8,700,000

Cash/bank: 600,000
Account receivables: 1,100,000
Maintenance store: 2,500,000
WIP: 1,500,000
Production store: 3,000,000

Common costs: 3,700,000
Common maintenance cost: 900,000
Other common costs: 2,800,000
Improvement costs: 0

Direct costs: 20,602,032

Quality loss cost: 970,102
Other direct costs: 1,200,000
Material: 19,431,930

Price/unit: 182.00 €

Material cost/unit: 118.00 €

Availability: 93%
Production speed: 85%
Quality performance: 95%

Max units/hour: 40 pcs
Max annual output: 208,000 pcs
Planned annual operation time: 5,200 hours

Difference in share value: 0

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OEE will impact on the share value

Lost Revenue 7,506,666 per year
Profitability 35.46%
Profitability margin 29.21%
Share value 328,493,445
Difference in share value 15,004,345
Tools to reach WCM

- Total Productive Maintenance (TPM)
  - 5S
  - MFO
- Reliability Centered Maintenance (RCM)
- Systemized Preventive Maintenance (PM)
- Condition Based Maintenance (CBM)
- Lean Maintenance
- Life Cycle Cost/Life Cycle Cost Concept (LCC/LCP)