

INCREASING PRODUCTION THROUGH OEE

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Agenda

1. Introduction
2. Challenges
3. Case Study
4. What is OEE?
5. OEE Deployment in F&B
6. Results
7. Summary
8. Questions

Introduction

Ekhosoft's History

- Established in 2000
- Founded as Inexcon Technology (iTt)
- Industrial Event Management software for:
 - Process Industries
 - Renewables (Power Factors)

Flexible, Configurable and Scalable Solutions



Intelligent
Maintenance



Overall Equipment
Effectiveness (OEE)



Mobile Inspection
Tours



Manufacturing
Execution (MES)



Downtime



Electronic Logs
& Shift Handover



KPI
Management



Root Cause
Analysis



Ekho for
renewables

One Solution for All Industries & Customers



Food & Beverage



PHILIP MORRIS INTERNATIONAL



Mining & Metals



One Solution for All Industries & Customers



Oil & Gas



Chevron Pipe Line Company



APPVION



Pulp & Paper



Kruger



WestRock



PAPER
EXCELLENCE



One Solution for All Industries & Customers

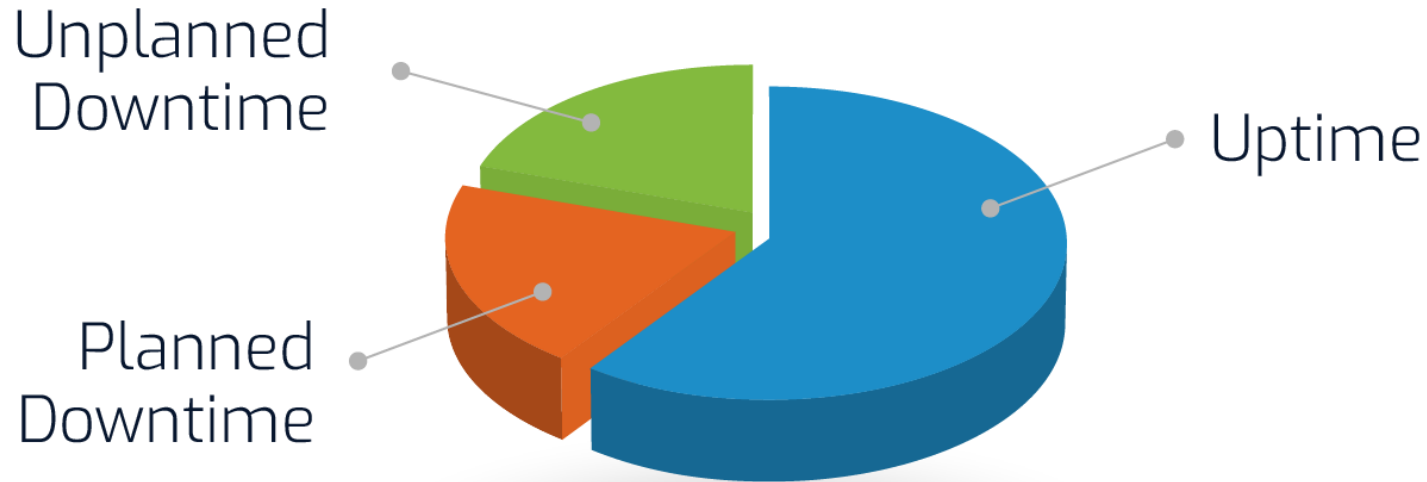


Renewables
Wind, Solar, Hydro, Biofuels & Co-Generation



Challenges

Challenge no.1: Increase Machine Uptime



Challenge no.2: Increase Visibility

- Unknown downtime loss
- Unknown performance loss
- Unable to compare different plants/lines
- Unable to measure improvements (ROI)

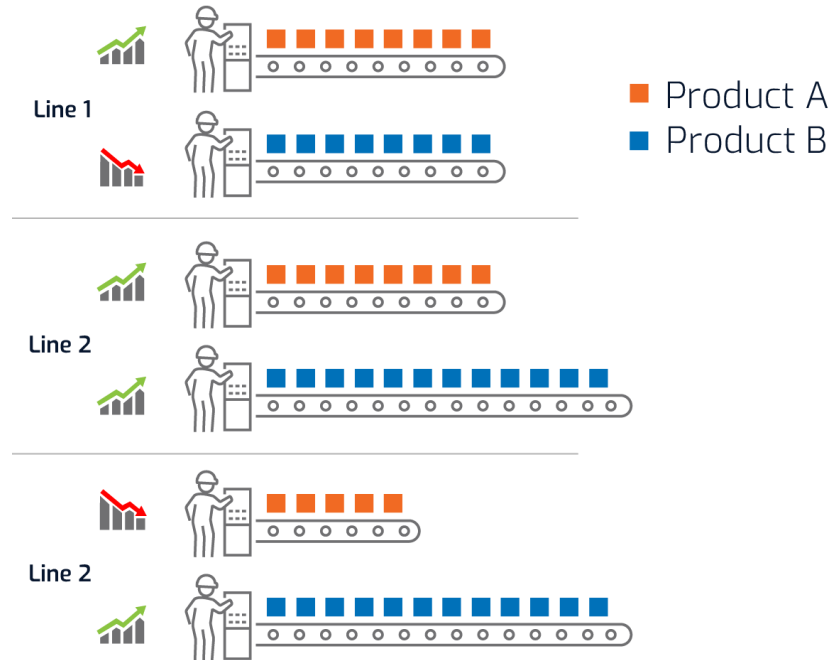
Challenge no.3: Optimize Scheduling

- Increasing number of SKUs
- Inefficient changeover planning
- Low product throughput

Low Product Throughput

The same product running on different lines can yield different results in areas:

- Total production
- Average production speed
- Units produced



Case Study

Company profile

- Food & Beverage producer
- Top 10 in Canada
- Multiple sites across Canada and USA
- Established 100 years ago
- Over 2000 employees
- Continuous expansion by acquisition and installation of new lines
- Built a new production line in 2018
(target: 80,000 packaged units/week)

Challenges

- Increasing number of SKUs (ex: organic products)
 - Shorter production runs
 - Increased changeovers
- Multiple stops (equipment failure)
 - Manual data collection process
 - Inaccurate data (over 50% of downtimes are uncategorized)
- Lack of metrics to justify capital expenditure

What is OEE?

Definition

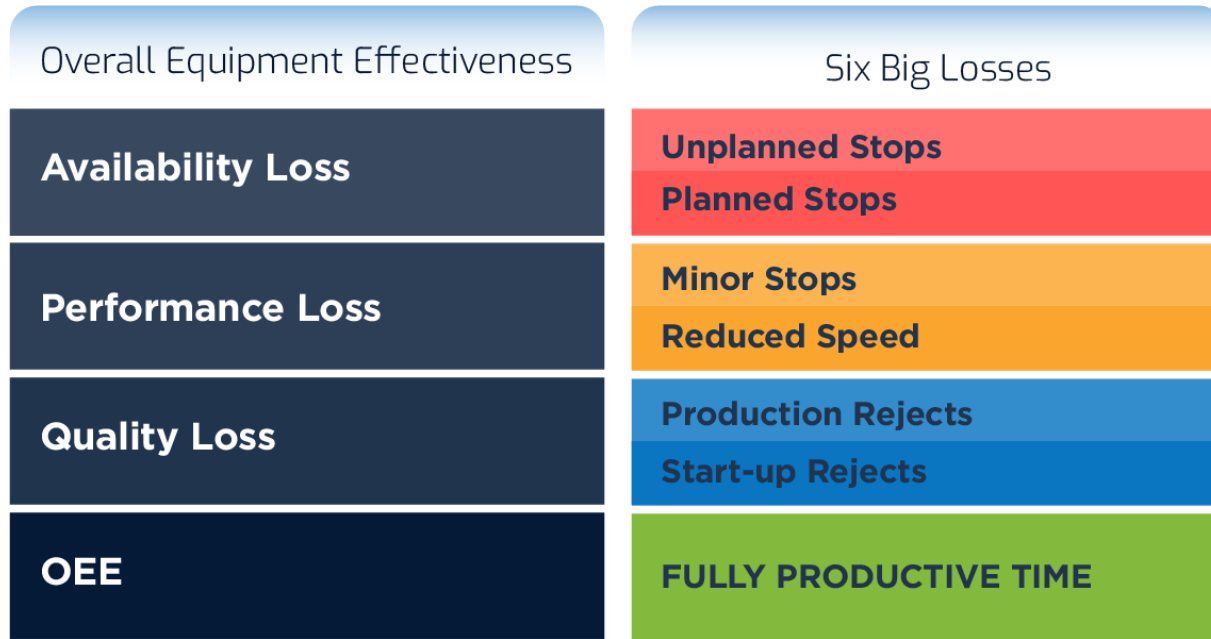
- Overall Equipment Effectiveness (OEE) quantifies how well a manufacturing unit performs relative to its designed capacity, during the periods when it is scheduled to run.
- OEE is focused on reducing losses in the manufacturing process.

Formula

Expressed as a formula, OEE is determined by multiplying three factors:



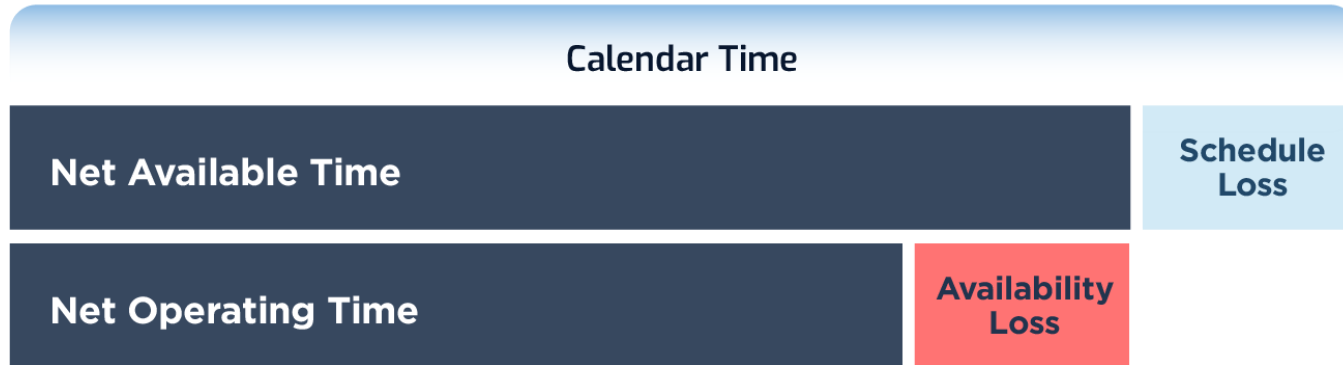
The Six Big Losses



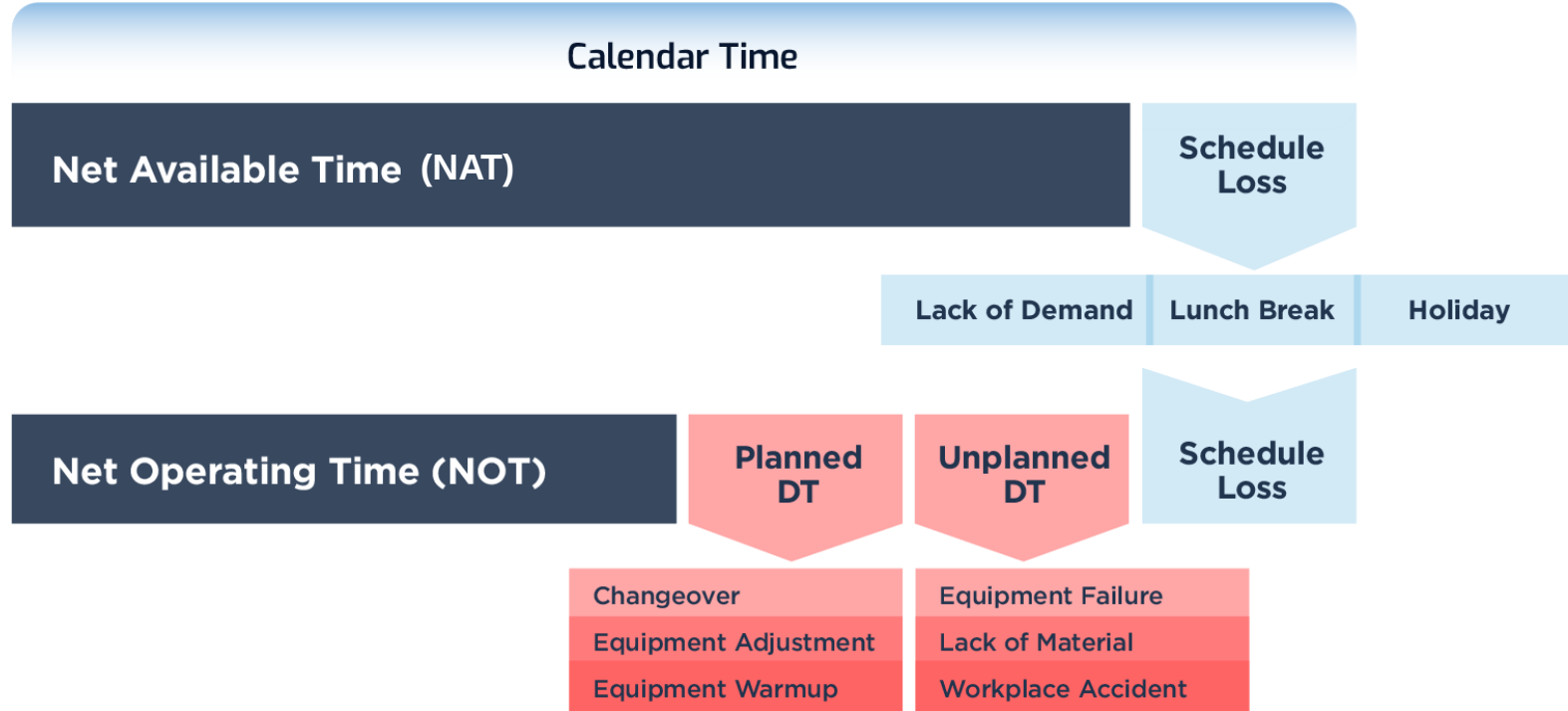
The Overall Picture



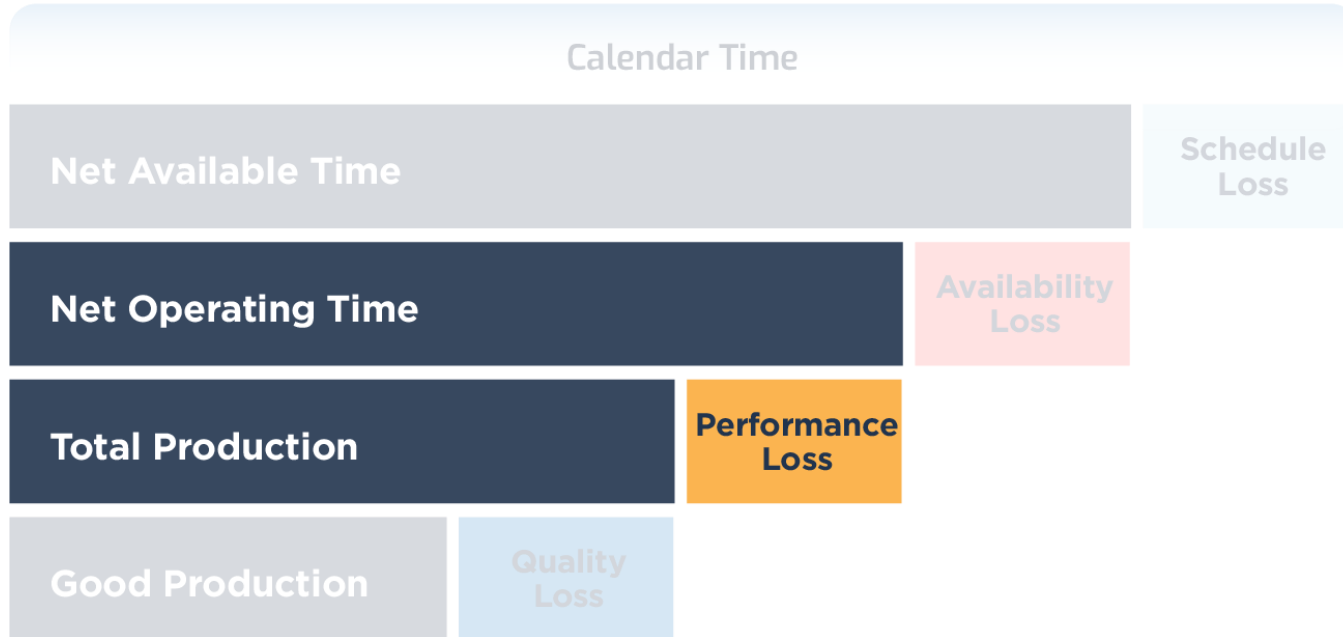
Availability



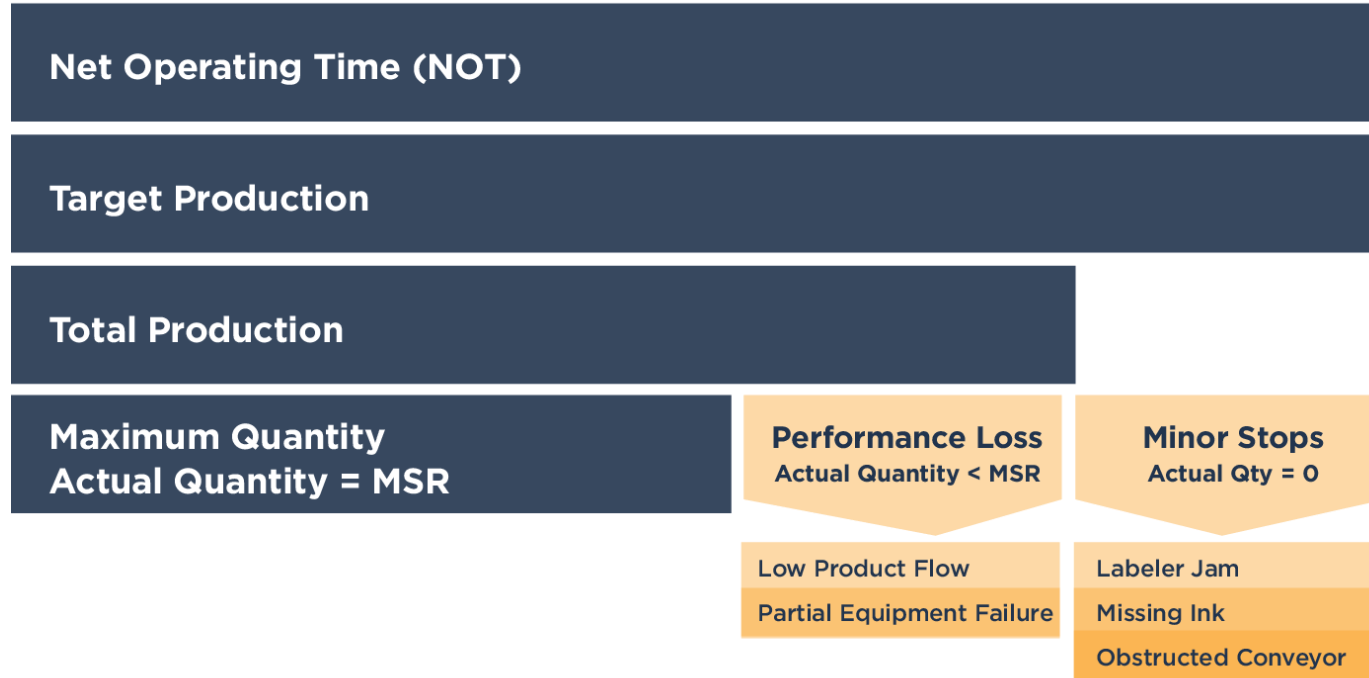
Availability = NOT / NAT



Performance



Performance



Performance

Total Production = $\sum$ (Actual Quantity)

Target Production = $\sum$ (MSR Quantity)

Performance = Total Production / Target Production

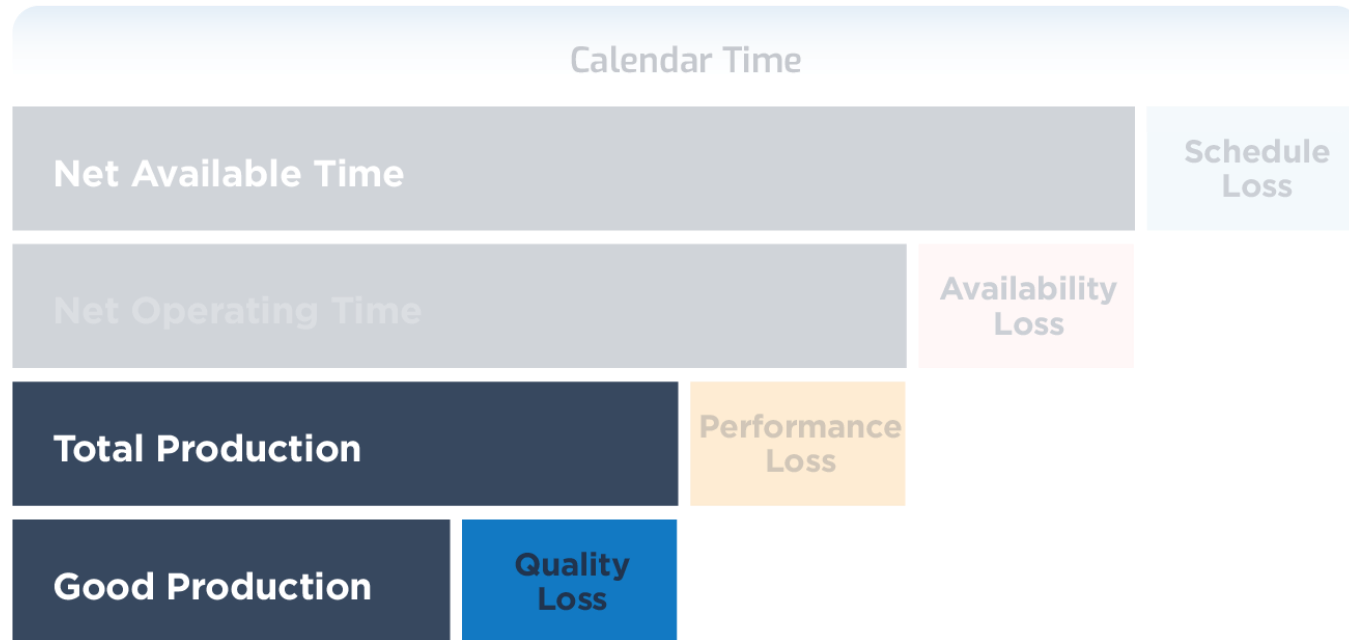
Performance

The Maximum Sustainable Rate (MSR) is determined by the two factors:

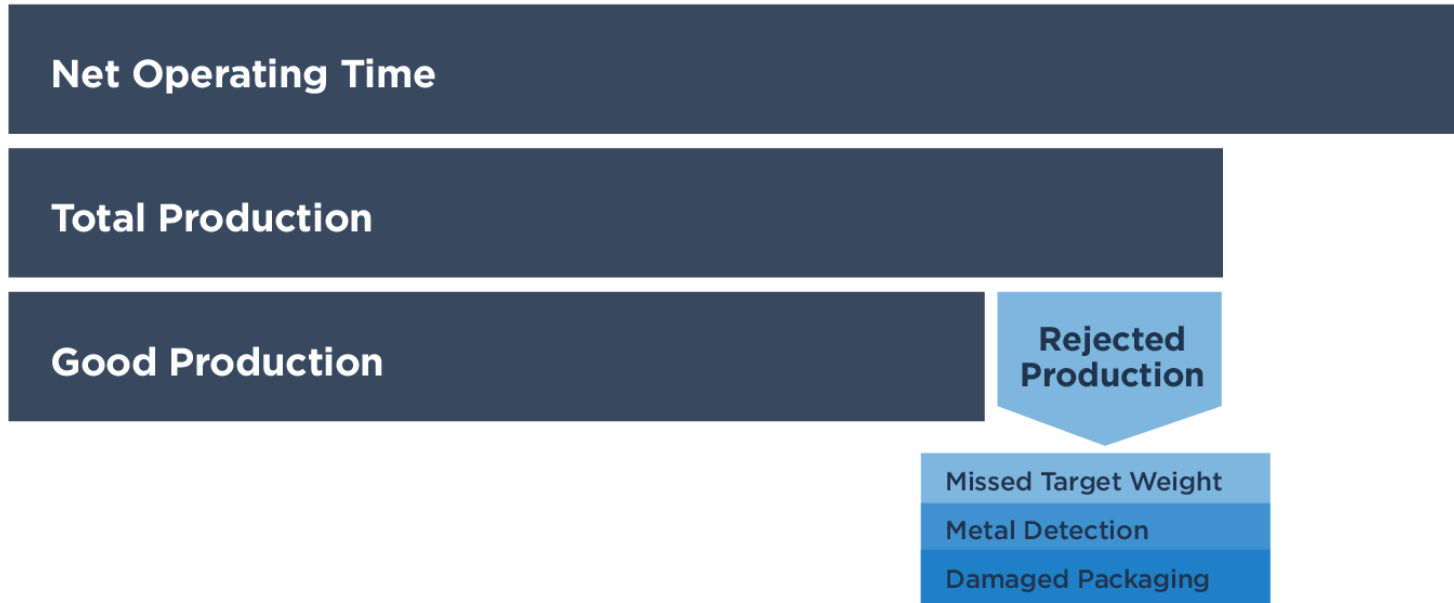
- Equipment's theoretical capacity
- Selected product

Minor Stops are “downtimes” below a time threshold
(ex: 5 minutes)

Quality



Quality = Good Production / Total Production



OEE Example



Calendar Time (h)	168
Closed on Sunday	24
1-hour break/shift	18
Net Available Time (h)	126
Changeover	13
Equipment Failure	18
Lack of product	3
Net Operating Time (h)	92
Availability (%)	73.0

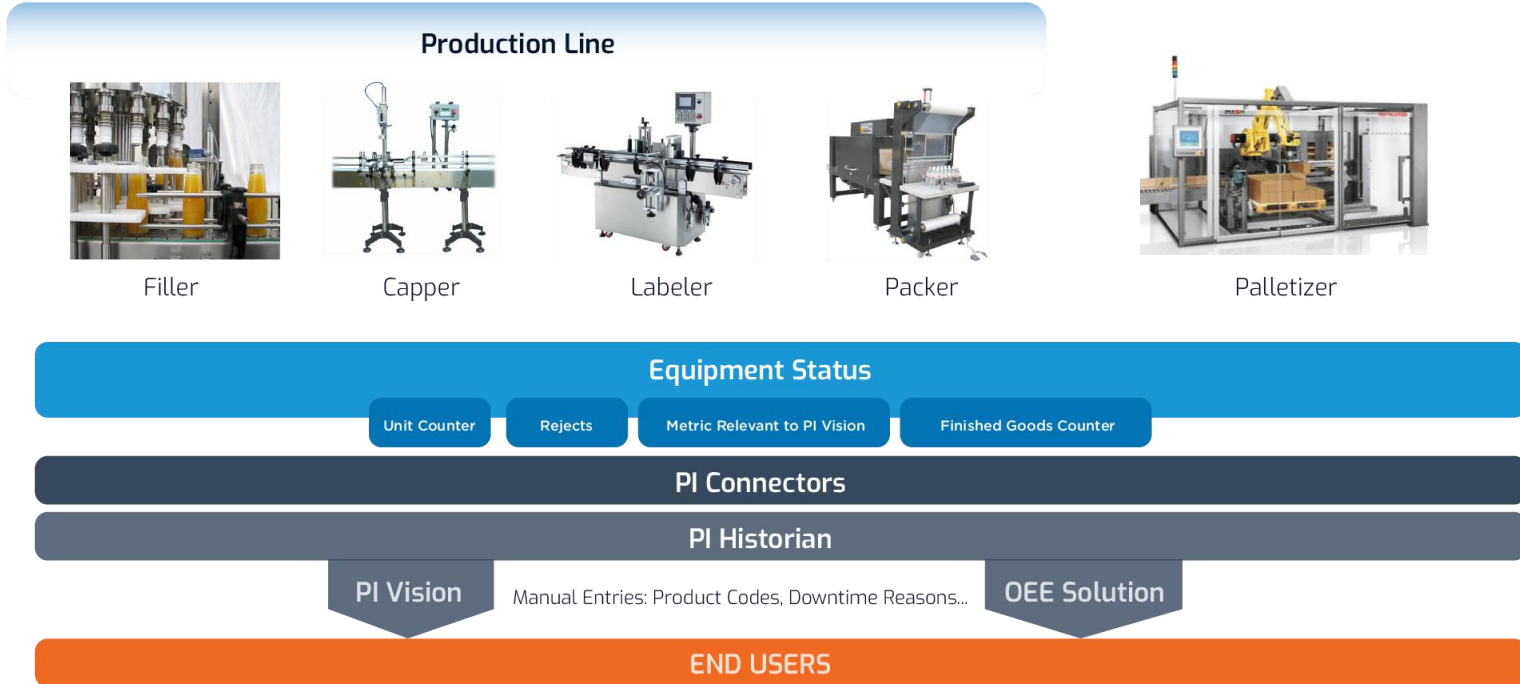
MSR (units/hour)	6000
Target Production	552000
Total Production	485000
Performance	87.9

Total Production	485000
Good Production	478000
Quality	98.6

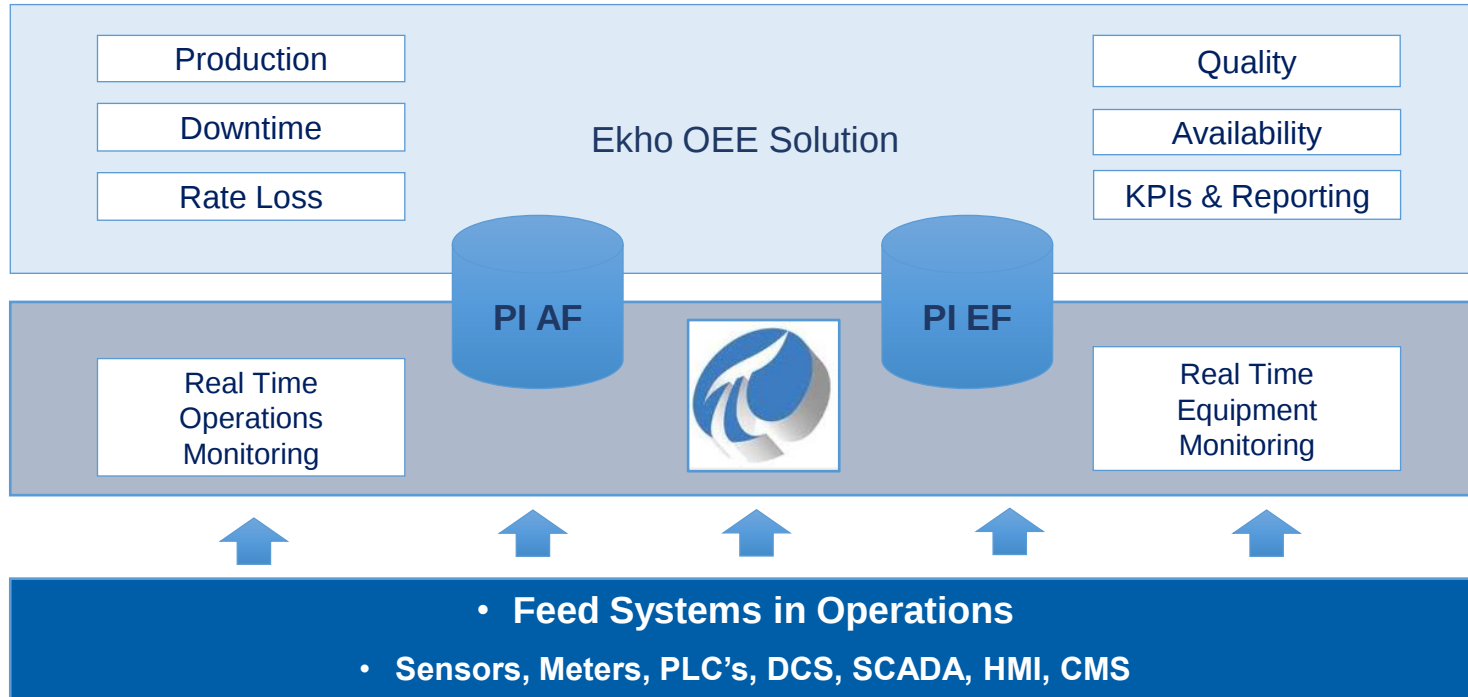
OEE	63.3
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OEE deployment in F&B

Overall Architecture



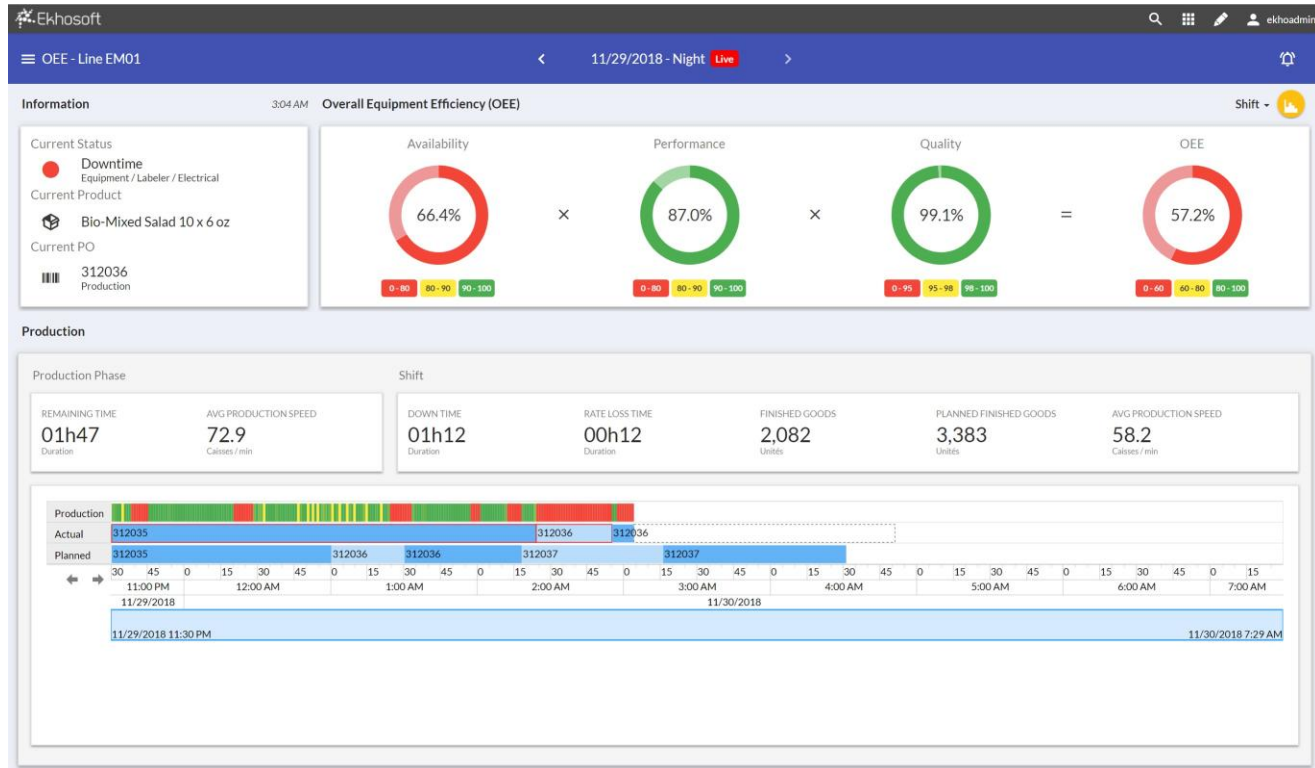
PI & Ekho Integration



3-Step Approach

1. Operator
2. Supervisor
3. Continuous Improvement/Management (Analysis)

Operator Line View



OSIsoft.
PI World SAN FRANCISCO 2019



Downtime Reason Classification

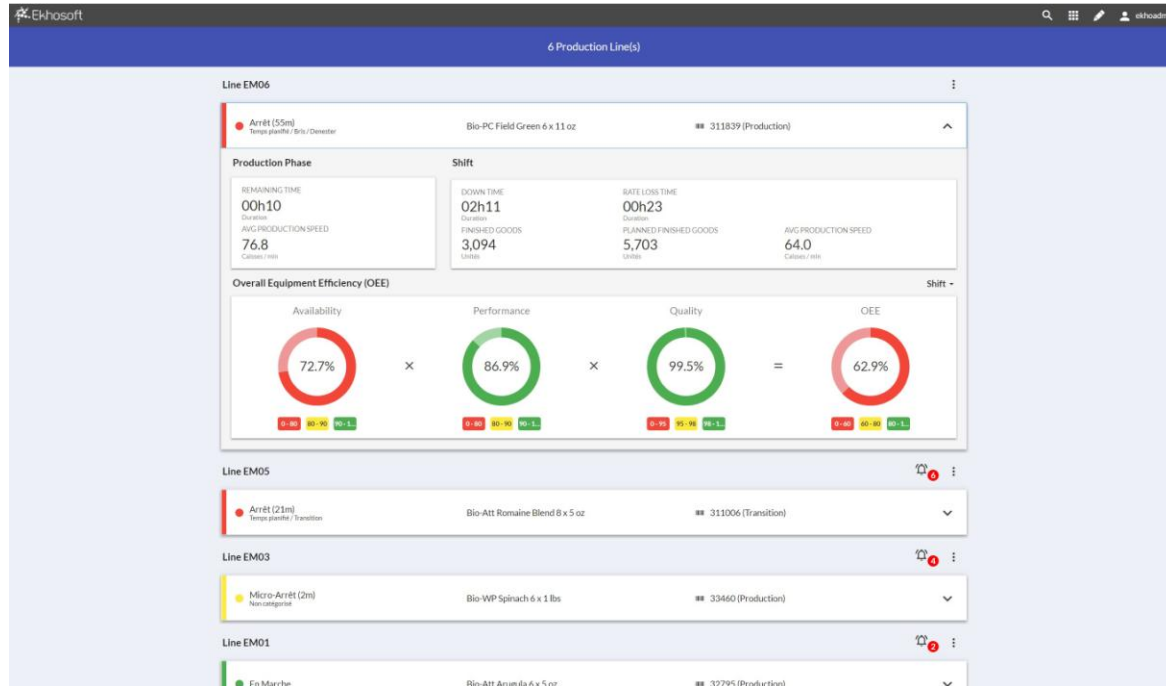
Reason code standardization
is key for analysis !

Define the right number
of levels

Level 1	Level 2	Level 3	Line A	Line B
Equipment	Filler	Electrical	☒	☒
		Mechanical	☒	☒
	Capper	Electrical	☒	☒
		Mechanical	☒	☒
	Labeler	Electrical	☒	☒
		Mechanical	☒	☒
	Packer	Electrical	☒	☒
		Mechanical	☒	☒
	Pasteurizer	Electrical	☒	☐
		Mechanical	☒	☐
Labor	Lunch Break		☒	☒
	Morning Break		☐	☒
	Training		☒	☒
Planned	Changeover	Product	☒	☒
		Format	☒	☒
	Sterilization		☒	☒
Production	Lack of product		☒	☒
	Lack of staff		☒	☒
	Lack of storage		☒	☒
Other	Act of god	Flood	☒	☒
		Power outage	☒	☒
	No demande		☒	☒
	Strike		☒	☒

Supervisor

What lines are not running and how long/why?

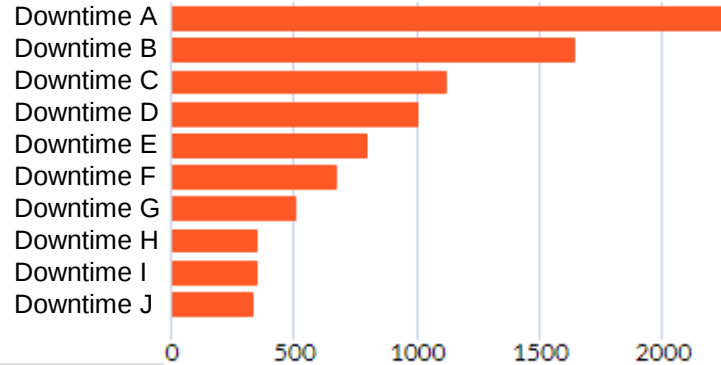


COMPARE
production values
to previous shifts

Analysis

Downtime Chart & Drill-Down

Availability by reason codes



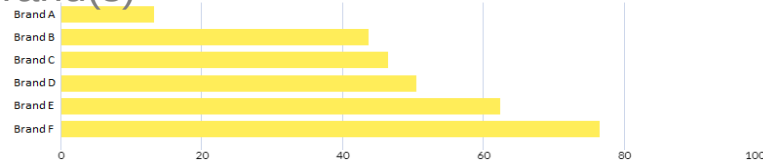
Availability – Downtime Reason A



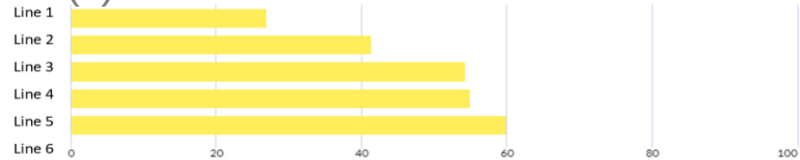
Analysis

OEE Comparison by Product/Brand/Format/Line/Shift

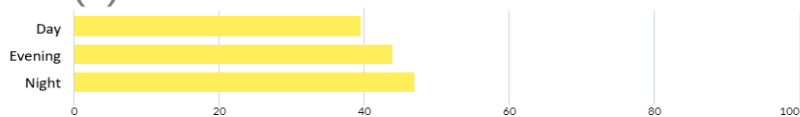
Brand(s)



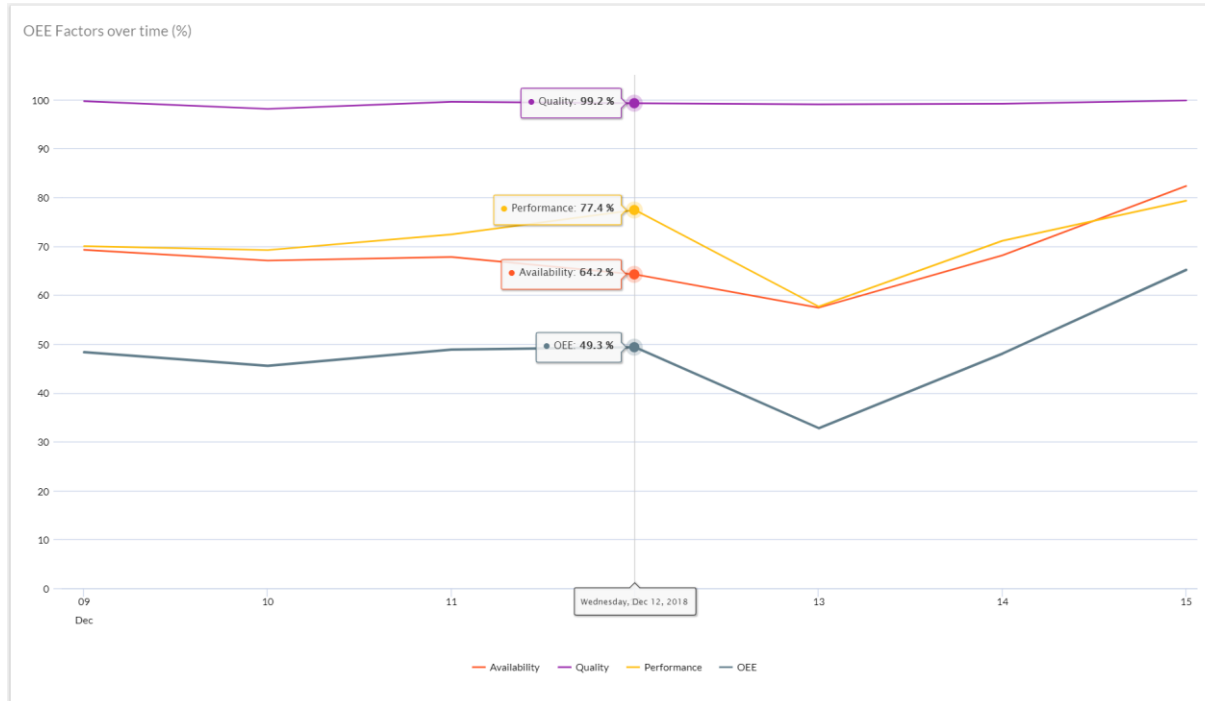
Line(s)



Shift(s)

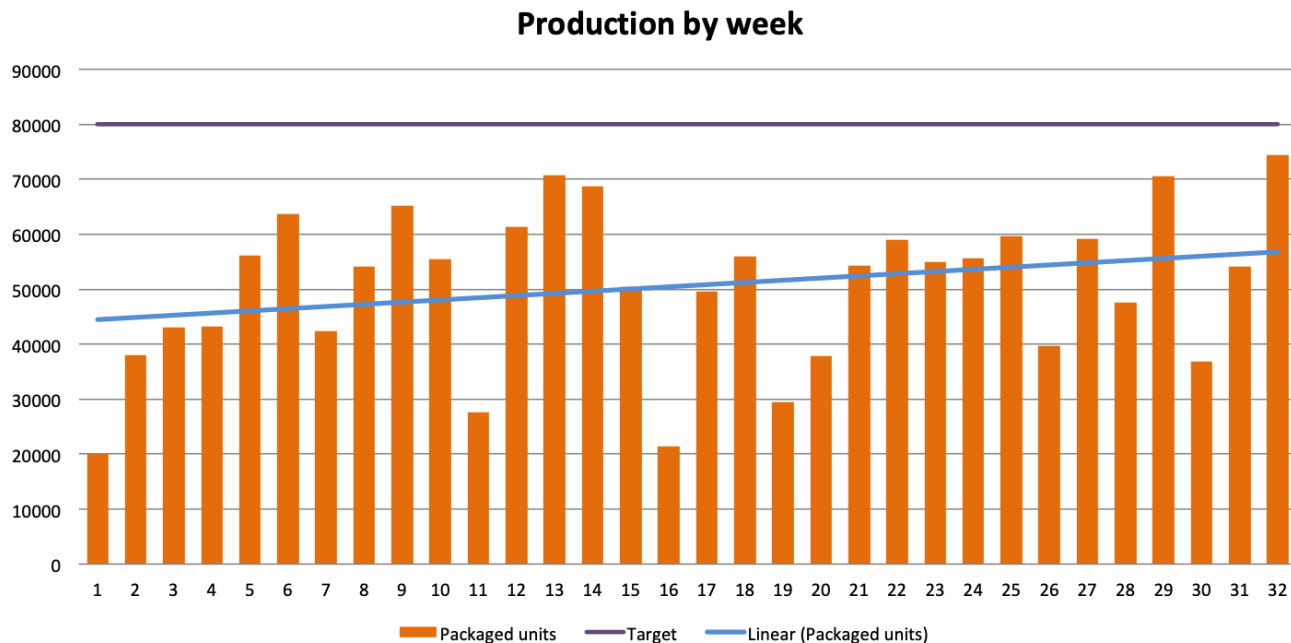


Analysis Trends



Results

Results



Results – Production Line

- Average increase of 300 packaged units per week
- Increased OEE by 8%
- All downtimes are categorized

Results – Company

- Benchmark/compare production lines of similar technology
 - Same calculations
 - Same downtime reasons
- Optimized production schedules by moving certain products to specific lines

Summary

Summary

- OSIssoft has long used the tag line “Measure - Know - Act”. Nowhere is this more applicable in addressing OEE within your industrial operations.
- The PI System can be used to capture most of the data electronically, and the pre-configured Ekho solution is easy to install – often within months, and is fully integrated with the PI System.

Summary

- Many of the benefits we have seen from OEE projects range in the 5% to 10% range within 6 months, from :
 - Improvements in capacity, production, equipment efficiency, quality, and/or
 - Reductions in set-up time, downtime, product rejects, maintenance costs.

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Questions?

Please wait for
the **microphone**

State your
name & company



Please remember

TO DOWNLOAD
APP, SEARCH
OSISOFT



THANK YOU

OSIsoft.
PIWorld

謝謝 KEA LEBONA
TAPADH LEIBH 고맙습니다
БАЯРЛАЛАА MISAOTRA ANAO
DZIĘKUJĘ CI NGIYABONGA TEŞEKKÜR EDERIM GRACIES
OBRIGADO شڪرا SALAMAT
DANKON TANK TAPADH LEAT
DANKIE TERIMA KASIH
KÖSZÖNÖM
СПАСИБО
PAKMET CIZGE
GO RAIBH MAITH AGAT
БЛАГОДАРЯ GRACIAS
ТИ БЛАГОДАРАМ
MAHADSANID
TAK DANKE
RAHMAT
HATUR NUHUN
MERCİ
PAXMAT CAĞA
CẢM ƠN BẠN
WAZVIITA
FALEMINDERIT
DANK JE
ΕΥΧΑΡΙΣΤΩ GRATIAS TIBI
AČIŲ SALAMAT MAHALO IĀ 'OE TAKK SKALDU HA
GRAZZI PAKKA PÉR
SIPAS JI WERE TERIMA KASIH
UA TSAUG RAU KOJ
ТИ БЛАГОДАРАМ
СИПОС
MULTUMESC
FAAFETAİ
ESKERRIK ASKO
HVALA ХВАЛА ВАМ
TEŞEKKÜR EDERIM
HVALA
DZЯKYI
DI OU MÈSI
ĐAKUJEM
MATUR NUWUN