



Business Processes

PRODUCTION EFFECTIVENESS & EFFICIENCY

Manufacturers that cannot consistently make what they are scheduled to produce are ineffective. Factories that produce too much scrap and whose output requires significant amounts of rework before it can be shipped to customers are both inefficient and ineffective.

OVERALL EQUIPMENT EFFECTIVENESS

There isn't a single metric that explains productivity, efficiency, and scrap but this is one clever attempt. Those three buckets are large in scope and require clarity to allow an OEE value to provide fair and meaningful information.

Many factors create complexity from variable speed machines, parts that can run at different rates on different machines, and "planned" scrap such as done while a machine is tuned in, warming up, or learning tolerances.

With all of these factors influencing OEE in most cases (including people and parts themselves) it may be more appropriately coined as Overall Production Effectiveness. (<http://www.six-sigma-material.com/OEE.html>)

Above right photo : <http://www.oeecalculation.com/>

INSIDE THIS ISSUE

Latest technology improves production	2
What is OEE and How Do You Calculate?.....	2
Food and Drink Manufacturers choose Idhammar OEE.....	3
Benchmarking Process Improvement	3

SPECIAL POINTS OF INTEREST

- OEE
- Productivity
- Benchmarking

Latest technology improves production:

DEVELOPMENT agency One NorthEast used cutting-edge laser technology to help improve production at a County Durham manufacturing firm. It helps manufacturing companies drive down lead times, reduce waste and stock and improve productivity to stay competitive.

Managers at 3M, which manufactures respirators for worker safety at its Aycliffe site, called in NEPA's Digital Factory specialists, to help them with inspecting tooling parts that were causing added waste in the manufacturing of gas and vapour respirator filters. Inspecting tooling parts would usually take two weeks and be a costly exercise, but the NEPA team were able to solve the problem in two days.

Sajid Abdullah, lead consultant at the Digital Factory, demonstrated the laser scanner, which provides a graphical comparison of the scanned item, automatically performing inspection, tool validation, wear analysis, object alignment, and 2D and 3D dimensional analysis. Mr Abdullah said: "By producing 3D point cloud data of the components, we were able to measure the components in every dimension, without limitations of specific locations as associated with 2D."

Source : <http://www.thenorthernecho.co.uk/news/2345962.print/>



Source : <http://www.oeecalculation.com/>

WHAT IS OEE AND HOW DO YOU CALCULATE?

When you think of OEE, you may associate it with equipment and productivity. Indeed, this is one way of measuring how well machines in the workplace are doing and how long they last. For those who don't know, OEE or overall equipment effectiveness is used in the company approach called **Total Productive Maintenance (TPM)**. TPM, in turn, targets machine effectiveness and sustainability in companies so that these machines can be operated to its optimum potential and maintained at that level.

Apparently, every company wants to add value to their products and services and what better way to have this value increased is by putting machines for production to good use and run them with as little misuse as possible.

Through the OEE computation, you can measure the performance of your company's equipment and identify potential problems as a way to improve or eliminate them. This measurement tool basically connects three elements together and yield an overall percentage. When you multiply the availability time the machine is operating, the quantity of products the machine is producing and the number of quality output of the total production, you get the overall equipment effectiveness.

But how do you get the rate of each element? You can get the **availability rate** or the time of the machine's operation by dividing the running time by the expected manufacturing time. For instance, if your equipment was running for 300 mins and the expected manufacturing time was 450 mins, your availability rate would become $300/450$ or 67 per cent. For its output performance, the rate is determined by dividing planned cycle time by the existent cycle time. One cycle refers to the total amount of time it needs to create one product. If the company's planned cycle time is 50 products every minute, for example, and the existent cycle time is only 25 products every minute, you would have a **performance rate** of $25/50$ or 50 per cent. Lastly in computing for the number of quality products made, find out by dividing the figure of quality pieces created by the entire production line. Let's say, if your equipment manufactured 100 items yet 30 of the items were found to be malfunctioning or flawed, it could indicate that out of the total 100 items, just 70 were first-rate giving you the **quality rate** of 70 per cent. Then, you can go ahead and multiply the rates of the three elements, giving you the OEE product in percentage which means multiplying 0.67 by 0.5 by 0.7, or 23 per cent. Potentially, the purpose of this measurement is improvement and understanding why the number is where it is helps to raise the standard of the company's production



FOOD AND DRINK MANUFACTURERS CHOOSE IDHAMMAR OEE

In the current economic climate, every second of production counts. Moreover, precision operation and reliable and accurate production information is fundamental to success in high pressure food manufacturing. The fittest companies with the lowest cost base will not only survive the recession, but they'll be better placed in the market when the health of the economy is restored. **Using an OEE system, Manufacturing Managers can perform detailed OEE analysis to pin point exactly where losses are occurring and deploy a range of tools to support the initiatives required to resolve the issues identified.** Discovering the true loss structure of a plant means that every opportunity for improvement can be capitalised - often adding up to big bottom line savings.

The financial value of a 1 per cent improvement in OEE can be staggering and recent studies have shown that **investment in OEE to improve existing plant is 10 times more cost-effective than purchasing new capital equipment.**

Growing numbers of food and beverage manufacturers, have found that replacing a series of spreadsheets with dedicated OEE Software and integrated Improvement Agenda means that time previously wasted on manipulating data can be better spent improving the plant. Leading food and drink manufacturers using the Idhammar OEE System to drive continuous improvement include:

- Premier Foods, the UK's largest food producer
- Burton's Foods
- Aunt Bessie's
- Largo Foods
- Chivas Brothers
- Constellation Europe
- Percy Dalton's Peanuts

The fast return on investment that manufacturers experience when they implement Idhammar OEE means that the financial justification for the dedicated system is clear.

Source: <http://www.idhammarsystems.com/case%20studies/oeefood%20and%20drink/>

BENCHMARKING :

PROCESS IMPROVEMENT

Key Findings

Scrap and rework wastes money and adds to the cost of making products, which in turn reduces the profit margin for which they can be sold. **Rework (and scrap replacement) conducted on a normal production line where there is also a capacity constraint is also preventing production of further new product – and so almost certainly upsetting the schedule adherence.**

Schedule adherence can be upset by many other factors too, including supplier transgressions, machine breakdowns and fundamentally unstable production processes. **Set-up and changeover times are an important factor in both process re-engineering and continuous improvement programmes**, but they are highly specific to the process in question and, again, are best addressed where there is a significant capacity constraint.

Upper quartile companies achieve levels of scrap and rework of about 1 per cent on each count, while lower quartile organisations manage to achieve only a rate of 5 per cent. Median firms are only half as good as the upper quartile.

Set-up and changeover times, while process specific, were on average twice as fast at upper quartile firms than at median companies and took almost twice as long again at lower quartile firms.

Upper quartile companies achieved schedule adherence levels of 95 per cent, compared with just 75 per cent at lower quartile manufacturers.

Factory managers must work towards stabilising both their own internal production processes and collaborate with suppliers (and purchasers) to achieve process input consistency for raw materials and/or finished components for assembly.

Source: The performance of manufacturing companies within Benchmark Index

For more information on
Innovation & Productivity
resources, Lean Six Sigma
project coaching and
implementation, research and
benchmarking and seminars,
please contact :

**Singapore Innovation &
Productivity Institute
c/o Singapore
Manufacturers' Federation**

2 Bukit Merah Central #03-00
SPRING Singapore Building
Singapore 159835

Telephone & Fax
(65) 6826 3000(65) 6826 3008

Email
sipi@smafederation.org.sg

Office Hours
9:00am to 6:00pm (Mon - Fri)

