

Overall Equipment Effectiveness (OEE)

You would use this approach to capture machine and process performance as part of continuous improvement activities.

Projected performance gains



Improved

- Machine Performance
- Machine Availability
- Quality of products and/or process yields

What investment is needed to understand the concept?

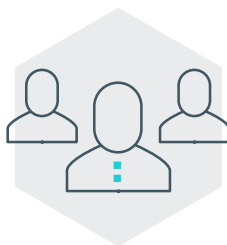
DIFFICULTY



Medium

Requires some reading around the subject and a structured approach

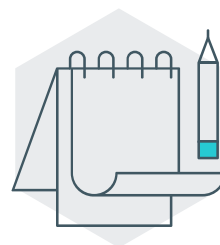
ACTIVITY



Team

Best results come from a team of Maintenance Engineers and Operators

EQUIPMENT



Some

White Boards, computer with Microsoft Excel

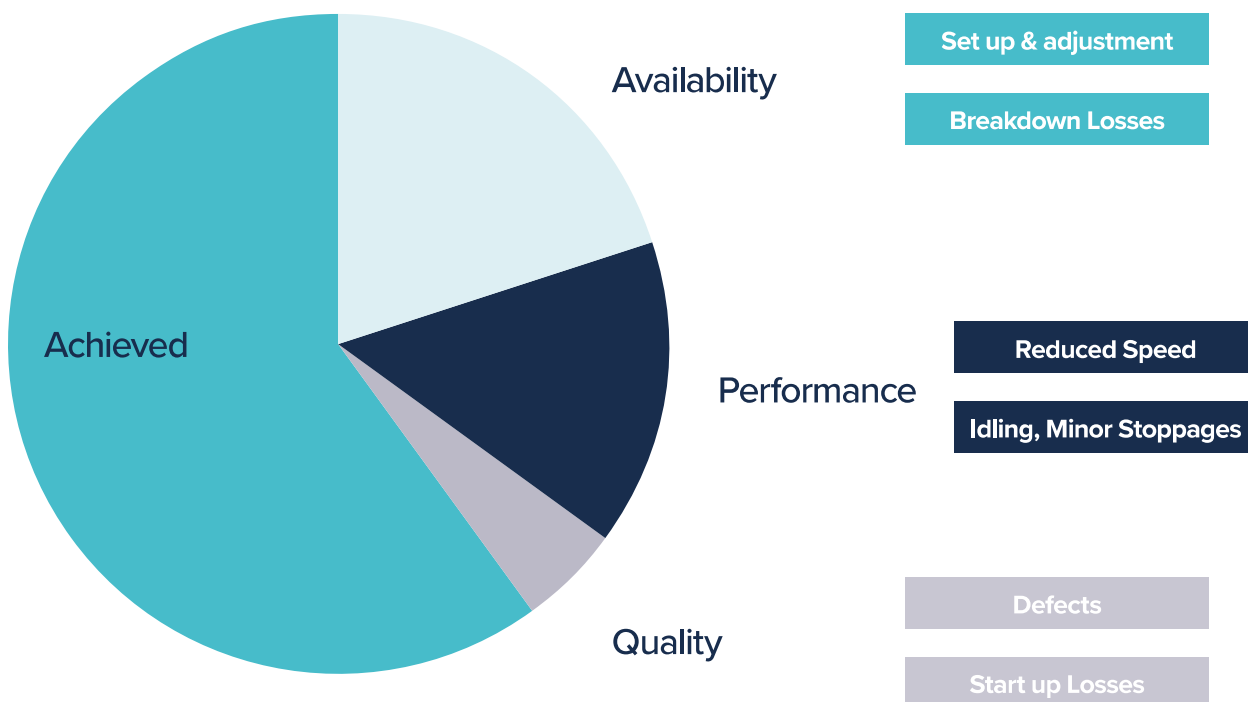
Explanation of the concept

Overall Equipment Effectiveness (OEE) is used to measure performance of machines and processes.

This approach gives users a complete view of performance, availability and quality of the machinery by tackling the “6 Big Losses” across three categories (Performance, Availability & Quality):

- Setups and Adjustments (Planned Stops) – focus on changeover/set-up time reduction
- Breakdowns (Unplanned Stops) – refurbish machines and instigate planned maintenance
- Reduced Speed (Slow Cycles) – eliminate reasons for slow cycle times
- Small Stops – collect data and work with Operators
- Production Rejects
- Start-up Rejects

Understanding losses



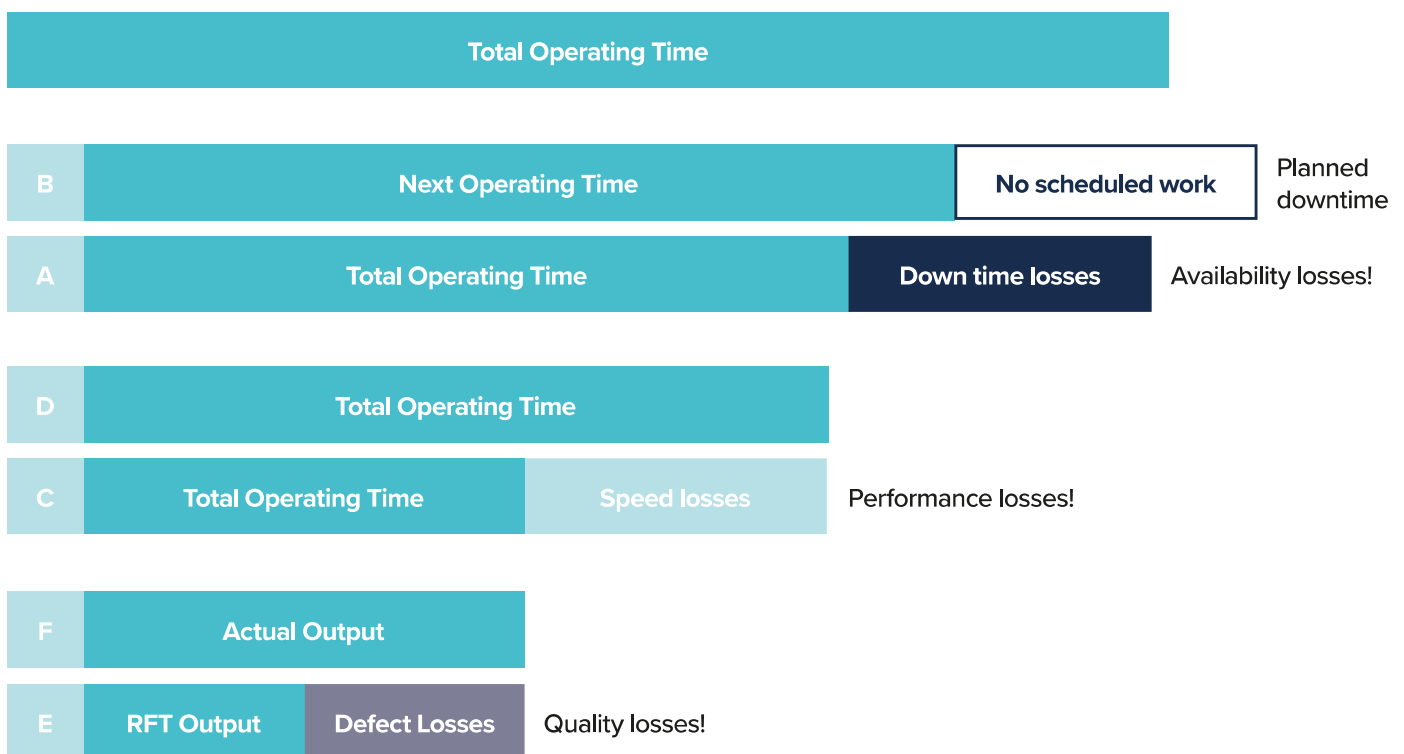
OEE is based on three major loss categories that reduce equipment throughput:

- **Performance** – relating to machine speed/run rate
- **Availability** – relating to small and large breakdowns/stoppages
- **Quality** – relating to the products/process yield from the machine

Explanation of the concept

Machines are potentially available 24/7 but we chose the shift pattern/working hours we use them for. It is during this planned running time that we apply OEE.

OEE shows us 'a rate of diminishing returns'



As an example, if we had planned to run for 10 hours but lost 1 hour due to unplanned stoppages, our Availability would have been 90%. If during the 9 hours we were actually running, our planned speed was 100/min, but our actual speed was only 90/min, our Performance would have been 90%. If only 9 out of 10 of the products we actually made were to the required quality level, our Quality would be 90%.

Our OEE would therefore be 90% x 90% x 90% = 72.9%.

In other words, we only achieved 72.9% of the potential output and have a 27.1% output improvement opportunity overall. OEE is used to identify the best areas to start improvement activity – “If you can’t measure it, you can’t improve it”.

What action should I take?

1.



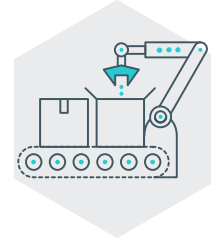
Gather together a group of Maintenance Engineers and Operators.

2.



Explain the concepts behind OEE.

3.



Identify a machine where OEE data can be collected.

4.



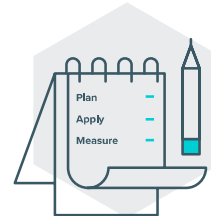
Collect OEE data for at least two weeks.

5.



Review the OEE data and identify the key issues – Performance, Availability or Quality.

6.



Develop an improvement plan.

Recommended resources



Goldratt, E. M. (2004). The Goal. Edition 3. Routledge.
ISBN 978-0566086656

Gotoh, F and Tajiri, M (1999). Autonomous Maintenance in Seven Steps. Productivity Press.
ISBN: 978-1563272196

Nakajima, S. (1989). TPM Development Program : Implementing Total Productive Maintenance. Productivity Press.
ISBN: 978-0915299461



[GC Business Growth Hub Factsheet 09: Kanban or Pull Replenishment Systems](#)

[GC Business Growth Hub Factsheet 19: Total Productive Maintenance](#)

[GC Business Growth Hub Factsheet 29: Upscaling Capacity Enhancement Techniques](#)

For more advice, case studies and additional factsheets visit: www.businessgrowthhub.com/manufacturing