

OEE (The six big losses)

| Total Operating time | | | | |
|--|---|--------------------|--------------------------|--|
| Availability | A | Net time Operating | *No scheduled production | |
| | B | Running time | * Failures * Setup | |
| Performance | C | Target Output | Lost effectiveness | |
| | D | Actual Output | | * Minor Stoppages * Reduced Stoppages |
| Quality | E | Actual Output | | * Scrap/rework * Startup losses |
| | F | Good Output | | |
| $OEE = \frac{B}{A} \times \frac{D}{C} \times \frac{F}{E}$ <p style="text-align: center;">Availability rate Performance rate Quality rate</p> | | | | |

What is OEE?

OEE (Overall Equipment Effectiveness) is the gold standard for measuring manufacturing productivity. Simply put – it identifies the percentage of manufacturing time that is truly productive. An OEE score of 100% means you are manufacturing only Good Parts, as fast as possible, with no Stop Time. In the language of OEE that means 100% Quality (only Good Parts), 100% Performance (as fast as possible), and 100% Availability (no Stop Time).

In an ideal factory, equipment would operate 100 percent of the time at 100 percent capacity, with an output of 100 percent good quality.

In real life, however, this situation is rare.

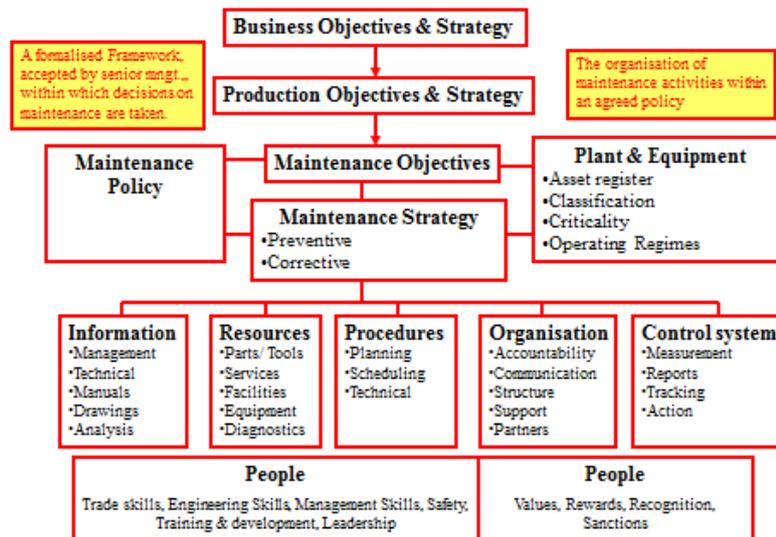
People often ask- where do these World-Class OOE numbers come from?

The answer is simple. Seiichi Nakajima led the introduction of TPM, OEE and the Six Big Losses in the early of 1970s while at the Japanese Institute of Plant Maintenance. In his 1984 book, Introduction to TPM, Seiichi include the above four world-class numbers.

Seiichi defined these numbers, based on his practical experience, as minimums for which companies should strive. He also noted that all of the companies winning the Distinguished Plant Prize awarded annually in Japan to plants that had successfully implemented TPM had OEE scores in excess of 85%.

The difference between the ideal and the actual situation is due to losses. Calculating the **overall equipment effectiveness (OEE) rate** is a crucial element of any serious commitment to reduce equipment- and process-related wastes through total productive maintenance (TPM) and other lean manufacturing methods like Operational Excellence, Six Sigma or World Class Manufacturing

Maintenance Management



Measuring OEE is a manufacturing best practice. By measuring OEE and the underlying losses, you will gain important insights on how to systematically improve your manufacturing process. OEE is the single best metric for identifying losses, benchmarking progress, and improving the productivity of manufacturing equipment (i.e., eliminating waste).