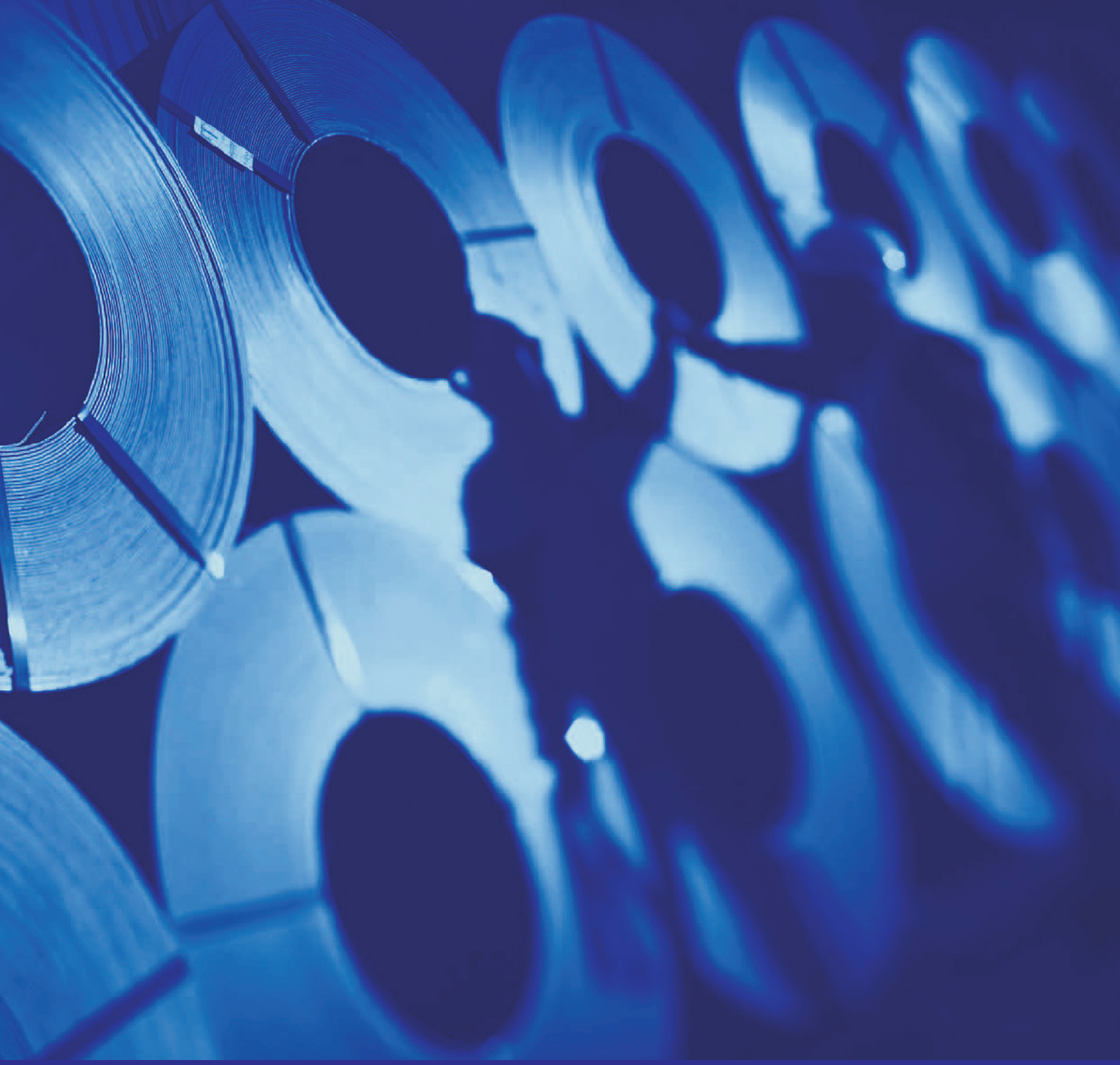


OEE InfoSheet

Enterprise Performance Analysis

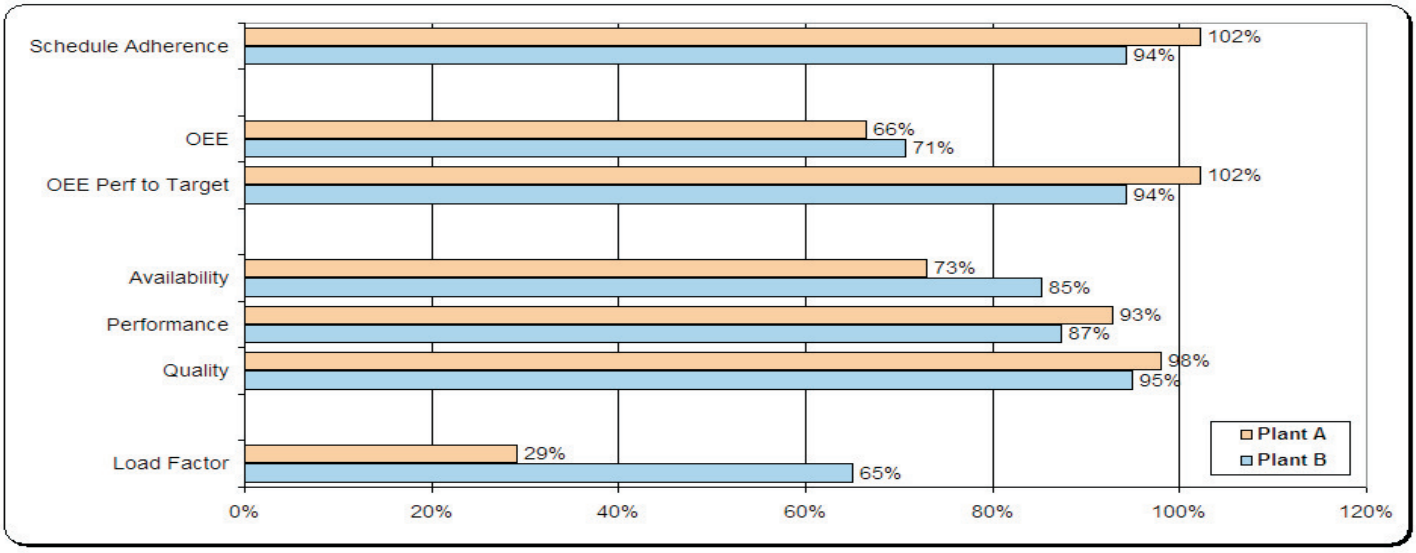
This InfoSheet outlines the approach to using OEE (Overall equipment Effectiveness) to analyse and compare the performance of manufacturing plants across the enterprise.

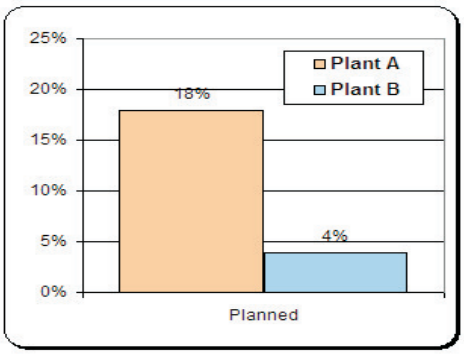
PerformOEE™ is the premier Manufacturing Intelligence and Performance Management software application, used by the world's leading regulated manufacturing companies as their preferred application for managing real-time operational performance improvement.

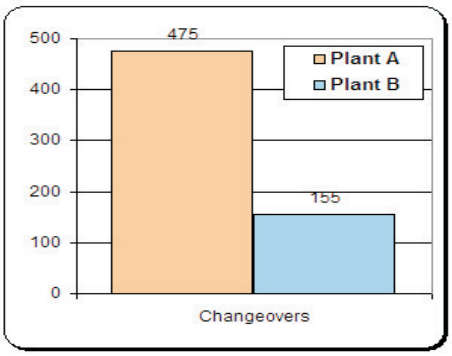
OEEsystems
Operational Excellence Solutions

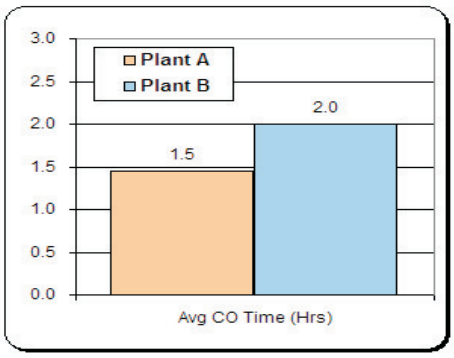
ENTERPRISE PERFORMANCE ANALYSIS

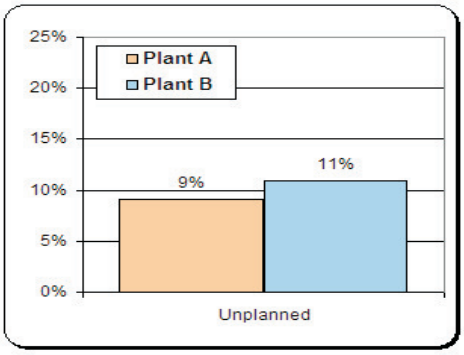
OEE Scorecard

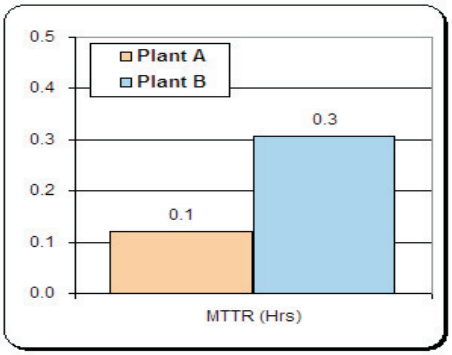


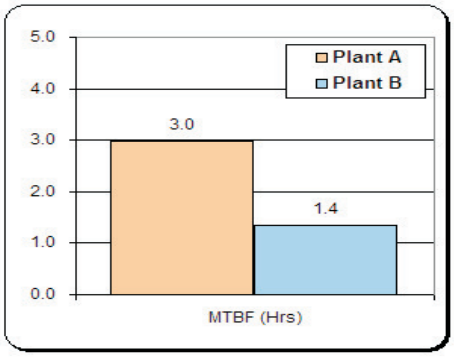


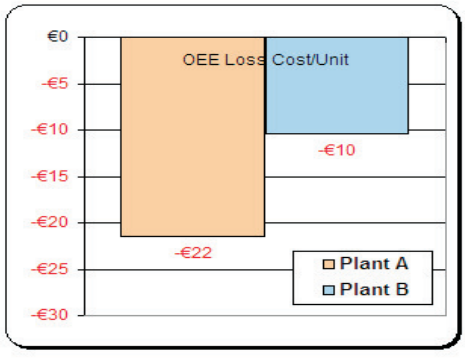


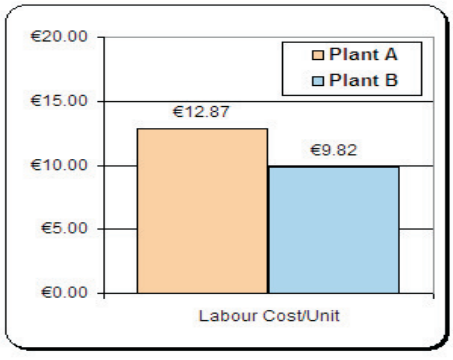


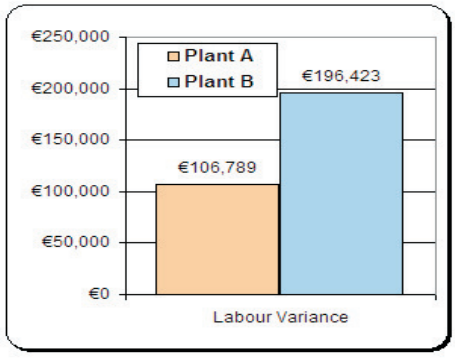












Comparing Plant Performance across the Enterprise

OEE (Overall Equipment Effectiveness) is a metric used to measure the effectiveness of the utilisation of capacity in a manufacturing plant or on a production line. It quantifies how much of the planned capacity is used to produce shippable product. It also quantifies the detailed capacity losses and pinpoints the root-causes for these losses. Within plant operations OEE is familiar to Operations Managers and Plant Managers as an excellent capacity management tool. Of course OEE is also an excellent tool (and metric) to analyse and compare the performance of different plants.

Limitations of using OEE alone for plant performance comparison

In order to make valid comparisons between different plants using OEE it is important to consider the business environments in which the plants operate. This business environment has a significant impact on the elements of OEE performance.

Using OEE alone as a metric to compare plant performance can give misleading results if the operating environment of the plant is not considered. It is often much more enlightening to use the component metrics of OEE (Availability, Performance and Quality) to make more meaningful comparisons. So, the OEE performance of a plant which manufactures a diversity of products for different markets and different customers may be much lower than the OEE performance of a single product plant which is manufacturing for a single market or for a small number of customers. This does not necessarily mean that the multi-product plant is the poorer performer !

An example of two Manufacturing Plants

Let's take the example of two manufacturing plants - Plant A is a high-volume manufacturer of multiple products for multiple markets. Its business is characterised by a high diversity of product, small lot-sizes and frequent changeovers. It runs two shifts, five days per week. Plant B manufactures product for a single market in very high volume. Producing in a low-cost location, the plant runs high volume production lots of a small number of products in a three-shift 24x7 operation.

Comparison Metrics

If we compare the overall performance of the two plants using the OEE Scorecard shown here we can draw the following conclusions :

Plant A has a schedule adherence of 102% compared to 94% for Plant B. However, the OEE performance for Plant A is only 66% compared to71% for Plant B, although Plant A has exceeded its OEE goal while Plant B has failed to meet its OEE target.

So which plant is the better performer ? Which plant in the candidate for new products ? And which plant has the capacity flexibility to deliver increased production output cost effectively ?

Delving deeper . . .

Let's look a little closer at the OEE Scorecard and the components of OEE performance -

Plant A has a lower OEE performance because, although its Performance and Quality is superior to that of Plant B, the Availability metric in Plant A is significantly worse than that in Plant B.

As we drill deeper and analyse Availability performance we see the that planned downtime in Plant A is more than four times that of Plant B. This is due to the fact that it carries out three times as many changeovers as Plant B, but with an average changeover time of 1.5 hours compared to 2.0 hours for Plant B. If we accept that the number of changeovers in Plant A is necessary because of the diversity of its product range and the number of markets it serves, then the performance of Plant A is superior to that of Plant B with regard to Availability.

If we then look at the unplanned downtime performance of the plant we see that although unplanned downtime in Plant A is only slightly less than that of Plant B, the MTTR (meantime to repair) is three times faster than Plant B and the frequency of unplanned downtime events, or MTBF (mean time between failures), is twice as good as that of Plant B.

When we then look at some of the OEE related costs for the plants we see that the OEE cost per unit in Plant A is more than double that of Plant B, primarily due to its higher operating cost and the higher value of the product it produces. For similar reasons the labour cost per unit in Plant A is higher than Plant B although it runs a labour variance one half of that of Plant B.

Finally, if we look at the load factor in each of the plants we see that Plant A is operating at less than one third of its total capacity capability while Plant B is operating at almost two-thirds of its capability. Plant A has significant latent capacity which can be delivered by adding shifts.

Conclusion

So in summary which plant is performing better ? Plant A, while lightly loaded and operating in a higher cost environment, performs better than Plant B. Although it has lower Availability, it has better Performance and higher Yield. Plant A has faster changeovers, fewer breakdowns, faster response times and runs a lower labour variance. It also has the potential to more than double it's current output while operating at a higher performance level. Using OEE and its component metrics we have successfully compared the plants' performances.

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