

*Most organisations need another key performance indicator like they need a hole in the head so where is the real added value that makes it worth the effort to use Overall Equipment Effectiveness (OEE)?*

To understand the value of OEE it is important to be clear about what it OEE is designed to measure.

Effectiveness measures how well a process has performed compared to its full potential. The reality of the shop floor is that there are many things that can go wrong over the day so for lots of reasons we generally don't achieve the full potential of our assets. In other words OEE presents in a single figure, how well we have managed the resources at our disposal. (See Appendix A for how to measure OEE)



Organisations that use OEE well are those that also adopt OEE focussed improvement tools to systematically reduce effectiveness losses (See Appendix B). Typically for organisations introducing OEE improvement, annual gains of 10 to 15% can be achieved. The good news is that this will be mostly achieved through low cost or even no cost improvements.

The potential business benefits are significant and include:

- Increased capacity at low or no cost;
- Improved predictability of output leading to improved delivery performance and shorter production lead times;
- Reduced material and labour costs;
- Improved quality consistency;
- Reduced scrap and rework.

Unfortunately many organisations embarking on the use of OEE lack of the underpinning capabilities and behaviours to:

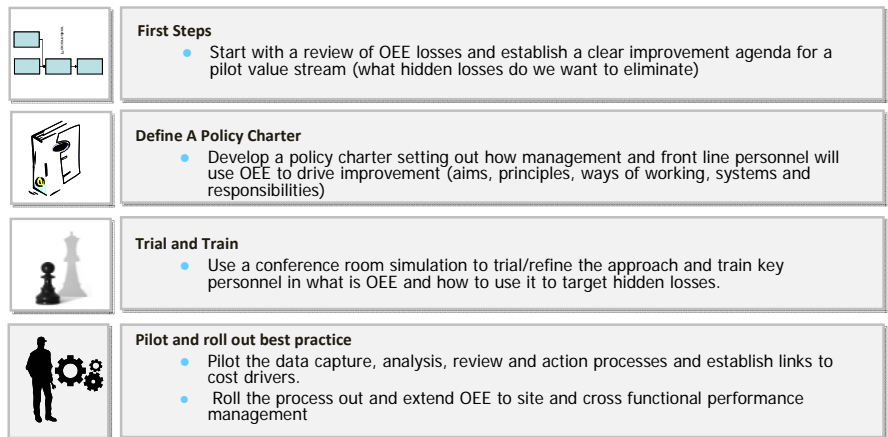
- Adopt data led performance management disciplines at all levels;
- Challenge and refine existing standards for equipment condition, best practice and process control/optimisation.

Successfully Implementing OEE will often require a structured programme to:

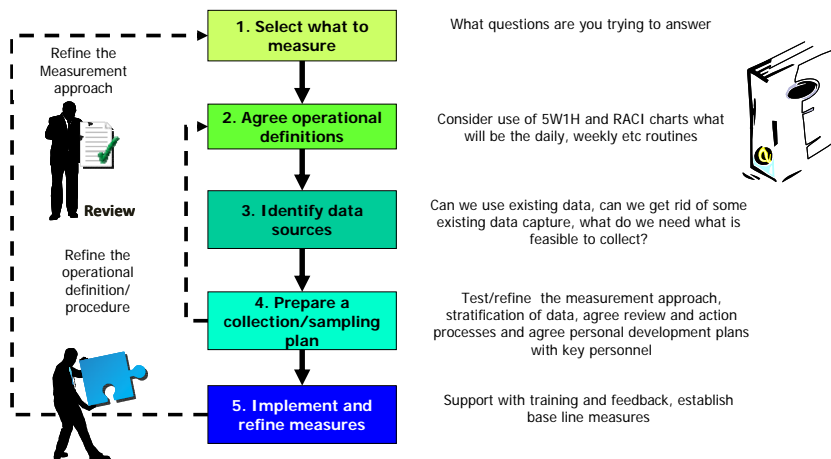
- raise understanding of the principles and techniques of focussed improvement;
- Secure the changes in management outlook to adopt a data driven approach to problem prioritisation and performance management;
- Improve discipline and conformance to best practice.

## OEE Implementation steps

Start off with one value stream and develop a model approach aligned with your business improvement drivers. Use the programme to engage the organisation in a conversation about what needs to change for continuous improvement of OEE to become a reality.



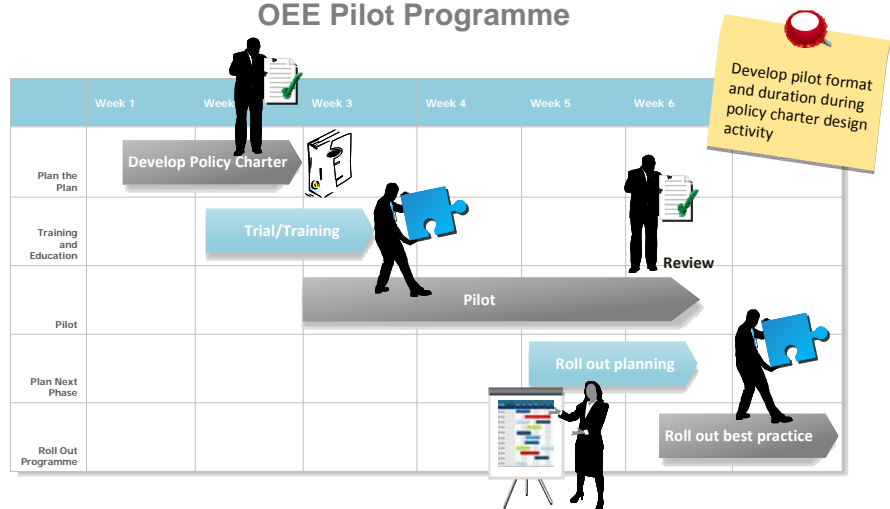
### Developing the Policy Charter



Use the development of a project charter to get buy in from key stakeholders. Expect this to be an iterative process as the lessons learned from the pilot are used to update the charter. As the organisation becomes more adept at focussed improvement keep this up to date to provide a training and reference aid.

Working on live data has more impact than using test data. Use the pilot experience to learn how to achieve data accuracy, simplify administration processes and develop focussed improvement capabilities. Ensure that the charter meets the needs of each key stakeholder before rolling the approach out.

### OEE Pilot Programme



## Appendix A

### Calculating OEE (Using the data in figure 1)

**Availability:** Out of the 100 planned run hours the process ran 80 therefore the process availability is 80%. (The 20% of non available time will be due to either breakdowns or set up and adjustment time.)

**Performance:** The theoretical capacity of this plant in the 80 hours run is 100 units but only 75 were produced so the performance (when running) is 75%.

**Quality:** Out of the 75

produced only 60 were produced right first time so the first time quality rate is 60/75 or 80%. Overall Equipment effectiveness is 80% x 75% x 80% that is 48%.

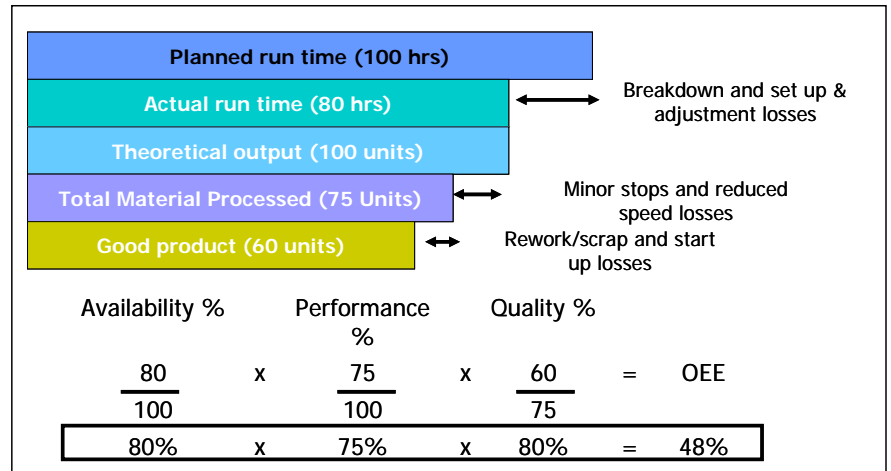


Figure 1: Calculating OEE

### Applying Focussed Improvement Tools

By measuring OEE over a representative period we get a representative assessment of the level of

- Time lost because the process was not working when we wanted it (Availability);
- Output lost because the process was not performing to nameplate capacity when running (Performance);
- Waste due to output not meeting quality specifications first time (Quality).

Effectiveness losses are typically categorised under 6 headings as shown in the loss analysis pie chart in figure 2. Each category aligns with an OEE focussed improvement tool to systematically reduce and where possible eliminate each loss area. (See Appendix B)

The first focussed improvement target is normally zero breakdowns. This is typically achieved by improving equipment condition and best practice routines which will also reduce quality and speed losses.

### Hidden Loss Analysis

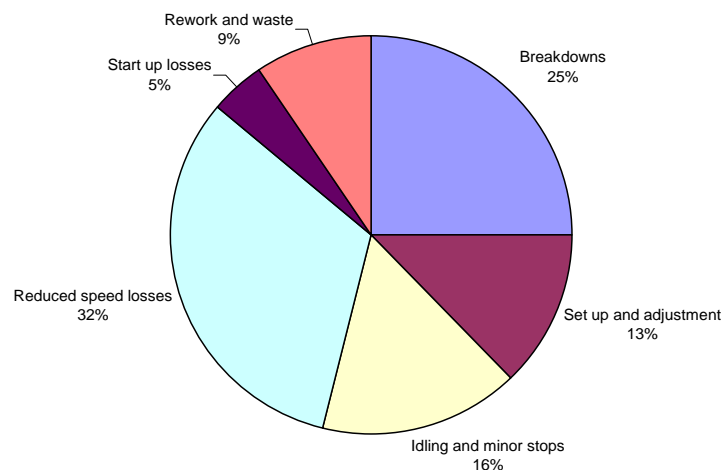


Figure 2: Effectiveness Loss Analysis Example

# Focussed Improvement Steps

Assessment	Level 1	Level 2	Level 3	Level 4
Breakdowns	BM>PM Significant breakdown loss, Unstable life spans	PM=BM, Breakdown losses still occur, Life spans more or less stable, Improvement activities under way	PM>BM, breakdowns less than 1%, life spans extended	Zero breakdowns, part life spans stable, high operability and maintainability
Set up and adjustment	No control, variation in working methods	Working methods formalised. set up time reduced but still varies,	Stable set up time, working on reducing internal set up and unnecessary adjustment	Set up time less than 10 minutes, some one touch changeovers, necessary adjustments reduced
Idling and minor stops	Minor stops unmeasured, many unplanned interventions	Minor stops analysed, tooling defects and working methods improved re overloading, quality abnormalities etc	Causes of minor stops analysed, actions re optimal conditions and improved equipment capability identified and under way	Reel to reel/no touch production, unmanned operation possible.
Reduced speed	Historically accepted speed standards varied to achieve quality conformance	Tentative speed standards set and maintained, latent causes of quality and mechanical defects identified	Cause effect relationship understood on a product basis, small speed losses compared to design speed.	Speed increased to design speed. Understand how to exceed this.
Quality defect and rework losses (including start up losses)	Regular quality problems accepted as normal, rework rates not monitored.	Quality problems identified and quantified, cause effect mechanisms understood and addressed on trial and error basis, rework levels and start up losses monitored.	All causes of quality problems analysed and understood, automatic in process detection of conditions likely to cause minor defects, start up losses reduced	Process quality capability improved to sustain zero defects at tighter tolerance levels, reduced start up losses and planned material waste