



# Equipment Losses & Overall Equipment Effectiveness (OEE)



## Introduction:

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OEE is the primary measure of performance in TPM. It is calculated by multiplying the availability, efficiency and quality rate of an equipment. This course allows us to understand the 7 major equipment losses encountered on our equipment each day and its relationship to OEE. Each loss is being discussed in detail and how it can be reduced or eliminated. What is important is for our people to understand what losses our equipment is suffering & how to measure it.

## Who Should Attend?

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OE champions, Maintenance managers, engineers & planners, reliability and maintenance engineers, facilities and utilities managers, top level maintenance technicians, operations and production managers & engineers, plant engineers, design engineers, reliability engineers & technicians, operators, safety engineers, risk engineers, CMMS and spare parts personnel, safety engineers and anyone who is involved in reliability engineering strategies or methodologies to include design engineers for capital projects engineers

## Course Objectives:

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**By the end of this course delegates will be able to:**

- Understand equipment losses and its major component including how to related these losses to Overall Equipment Effectiveness
- Learn how to analyze OEE data in order to determine equipment constraint and bottleneck
- Understand the 7 Major Equipment Losses and how to minimize them in order to improve OEE
- Understand how to deal with these individual losses and the best maintenance indices to use
- Provide guidelines on how to improve these types of losses

**Course Outline:**

- Breakdown Loss
  - What constitute a Failure?
  - Understand Primary and Secondary Failures
  - Lessons about failure
  - MTBF to measure breakdown loss
  - Take quiz on What to Include and Exclude on Failure
- Set-up and Conversion Loss
  - Set-up and conversion defined
  - Shigeo Shingo on reducing conversion time
- Start-up Losses
  - Infant Mortality and Random Failures
  - How PM affects start-up losses
  - How to reduce start-up losses
- Idling & Minor Stoppages

- Understanding Chokotei
- Best pillar to address Minor stoppages
- Performing MTBA Snapshots
- Design Speed Loss
- Speed loss defined
- Reducing speed losses
- Defect and Rework Losses
  - Understanding chronic defects
- Idling – Minor Stoppages
- Reduced Speed (Production Capacity) Losses
- Defects Losses
- Quality Defects & Re-Work
- Start-Up Yield Losses
- Losses & Losses Time
- Overall Equipment Effectiveness
- Activity Rate
- Operativity Rate
- Net Operating Rate
- Operating Speed Coefficient
- Performance Rate
- Quality Rate
- OEE Formula
- OEE Calculation Sheet
- Activity Rate
- Operativity Rate
- Net Operating Rate

- Operating Speed Coefficient
- Performance Rate
- Quality Rate
- OEE Formula
- OEE Calculation Sheet
- Equipment Ranking
- OEE Record Keeping
- OEE Monitoring Chart
- OEE Records Analysis – Graphs – Launching Improvement Actions
- OEE & 6-Sigma – Example of OEE Analysis
- Modern OEE Developments: Safety Rate & Environment Control Rate
- Equipment-Related Waste
- Understanding Overall OEE