



## Capacity (LCR/MCR) & Operational Equipment Effectiveness (OEE)



# LCR / MCR Definitions

- **Lean Capacity Rate or LCR;**
  - shall mean the normal weekly number of Parts that can be constantly manufactured by Supplier (without overtime or additional shifts)
- **Maximum Capacity Rate or MCR;**
  - shall mean the maximum weekly number of Parts that can be temporarily manufactured by Supplier

# LCR / MCR Calculations

- **Normal Working hour**
  - 24 Hour per day
  - 5 days per week
  - 30 parts per hour
- Example 1; 24 hr X 5 days X 30 parts X 85% (World class OEE)

**LCR = 3060 parts per week**

- Example 2; 24 hr X 6 days X 30 parts X 85% (World class OEE)
  - Supplier does have the possibility to work an extra day per week in overtime

**MCR = 3672 parts per week**

# What is OEE?

- OEE; Overall Equipment Effectiveness
- OEE in french is TRG; Taux de Rendement Global
- A « best practices » metric, expressed in percentage, to monitor and improve the efficiency of a manufacturing process (automated or manual)
- A tool that measures and identifies the causes of productivity losses, classifying them into three categories:
  - Availability
  - Performance
  - Quality

# What are the objectives of OEE?

- Evaluate the available capacity
  - Increase production capacity and consistently maintain level over time
  - Generate accurate production data for improved production planning
  - Identify the sources and weight of inefficiencies to allow prioritization
  - Example of Calculation
    - An equipment has a theoretical cycle time of 2 minutes (30 parts/hour)
    - Assuming the equipment produced 180 good parts on a 8 hour shift
    - 180 good parts @ 30 parts/hour = 6 hours production
- 6 theoretical hours of production / 8 true hours of production X 100 = **OEE 75%**

# Definitions, calculation....

- We want to calculate a single 8-hour shift OEE of an equipment that has a theoretical speed of 30 parts/hours using the following factors:
  - Loss of 3 hours due to equipment downtime
  - Loss of 25 parts during the Operating Time due to slower equipment speed
  - 5 parts did not meet quality specs and were rejected

• Availability (TU) =  $\frac{(8 \text{ hours} - 3 \text{ hours})}{8 \text{ hours}}$  X 100 = 62,5%

• Performance (TP) =  $\frac{(125 \text{ parts @ } 30 \text{ parts/hr})}{(8 \text{ hours} - 3 \text{ lost hours})}$  X 100 = 83,3%

• Quality (TQ) =  $\frac{(125 \text{ parts} - 5 \text{ rejected parts})}{125 \text{ produced parts}}$  X 100 = 96,0%

**Output of 120 good parts instead of 240 (30 parts /hr X 8 hr)**



**OEE of 50%**

# What is a world class OEE?

- A World Class OEE for discrete manufacturing plants is considered to be 85% or better

OEE Factor	WORLD CLASS
OEE	85 %
Availability	90 %
Performance	95%
Quality	99 %

# TOP 6 Big Losses

- **Breakdowns**
  - Tooling and equipment failures, unexpected maintenance
- **Setups and Adjustments**
  - Planned setups, material and labor shortages, warmup time
- **Small Stops**
  - Jams, misfeeds, sensor block, flow obstructed, cleanup
- **Reduced Speed**
  - Rough running, employee inefficiency, equipment wear
- **Startup Rejects**
  - Scrap, rework, incorrect assembly
- **Production Rejects**
  - Scrap, rework, incorrect assembly





*ski-doo LYNX SEA-DOO Evinrude ROTAX CAN-AM*